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| **A. General Information** | | | | | |
| 01 | Dwelling Unit Name |  | 02 | Climate Zone |  |
| 03 | Dwelling Unit Total Conditioned Floor Area (ft2) |  | 04 | Number of Space Conditioning Systems in this Dwelling Unit |  |
| 05 | Certificate of Compliance Type |  | 06 | Method Used to Calculate HVAC Loads |  |
| 07 | Calculated Dwelling Unit Sensible Cooling Load (Btu/h) |  | 08 | Calculated Dwelling Unit Heating Load (Btu/h) |  |
| 09 | Dwelling Unit Number of Bedrooms |  |  | | |

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| **MCH-01a – Space Conditioning Systems Ducts and Fans - For use with Performance Certificate of Compliance** |

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| **B. Design Space Conditioning (SC) System Component Specifications from CF1R**  This table reports the space conditioning system features that were specified on the registered CF1R-PRF compliance document for this project. | | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 |
| SC System ID/Name from CF1R | SC System Type | Heating System Type | Cooling System Type | Central Fan Ventilation Cooling System Type | Distribution System Type | Required  Thermostat Type | Low Leakage Air-Handling Unit Status | Bypass Duct Status | Cooling Zoning Type | Cooling System Compressor Speed Type |
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| **C. Design Space Conditioning (SC) System Compliance Requirements from CF1R**  This table reports the space conditioning system features that were specified on the registered CF1R-PRF compliance document for this project. | | | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 |
| SC System ID/ Name from CF1R | Heating  Efficiency  Type | Minimum  Heating  Efficiency  Value | Heat Pump Heating Capacity  @ 47°F | Heat Pump Heating Capacity  @ 17°F | Minimum  Cooling Efficiency  SEER | Minimum  Cooling Efficiency  EER | Minimum Cooling System Airflow Rate (CFM/ton) | Maximum  SC System Fan Efficacy (W/CFM ) | Modeled Duct R-Value | Central Fan  Ventilation  Cooling Airflow | Central Fan  Ventilation  Cooling  Fan Efficacy |
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| **D. Installed Space Conditioning (SC) System Component Information** | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 |
| SC System ID/Name from CF1R | SC System Description of Area Served | Conditioned Floor Area Served by the System (ft2) | Heating  System Type | Cooling  System Type | Number of Indoor Units Connected to the System's Outdoor Unit | Distribution System Type | SC System  Thermostat Type | Cooling Zoning Type | Cooling System Compressor Speed Type |
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| **E. Installed Heating Equipment Information (not heat pumps).** | | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 |
| SC System ID/Name from CF1R | SC System Description of Area Served | Indoor Unit Name or Description of Area Served | Does Indoor Unit Provide CFI IAQ Ventilation? | Indoor Unit Duct Status | Heating Efficiency  Type | Heating Efficiency  Value  (%) | Heating Unit Manufacturer | Heating Unit Model Number | Heating Unit Serial Number | Rated Heating Capacity, Output (Btu/h) |
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| **F. Installed Cooling System Outdoor Condensing Unit or Package Unit Equipment Information (not heat pumps)** | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 |
| SC System ID/Name from CF1R | SC System Description of Area Served | Cooling Efficiency  SEER | Cooling Efficiency  EER | Condenser or Package Unit Manufacturer | Condenser or Package Unit Model Number | Condenser or Package Unit  Serial Number | System Cooling Capacity at Design Conditions (Btu/h) | Condenser Nominal Cooling Capacity  (ton) | Condenser  Rated Cooling Capacity  (Btu/h) |
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| **G. Installed Split System Indoor Unit (Coil or Fan Coil) Equipment Information - applicable to DX or hydronic, heating or cooling, coils and fan coil units.**  Systems with more than one indoor coil or fan coil unit (e.g. multi-split systems) shall provide information for each of the system indoor unit coils or fan coil units. | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 |
| SC System ID/Name from CF1R | SC System Description of Area Served | Indoor Unit Name or Description of Area Served | Indoor Unit Type | Indoor Unit Duct Status | Does Indoor Unit Provide CFI IAQ Ventilation? | Indoor Unit Manufacturer | Indoor Unit Model Number | Indoor Unit Serial Number | Indoor Unit Nominal Cooling Capacity (ton) |
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| **H. Installed Heat Pump System – Split System Condensing Unit or Package Unit Equipment Information** | | | | |
| 01 | 02 | 03 | 04 | 05 |
| SC System ID/Name from CF1R | SC System Description of Area Served | Condenser or Package Unit Manufacturer | Condenser or Package Unit Model Number | Condenser or Package Unit  Serial Number |
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| **I. Installed Heat Pump System – Efficiency and Performance Compliance Information** | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 |
| SC System ID/Name from CF1R | SC System Description of Area Served | Heating Efficiency Type | Heating Efficiency Value | System Rated  Heating Capacity at 47°F | System Rated  Heating Capacity at 17°F | System Rated  Cooling Efficiency  SEER | System Rated  Cooling Efficiency  EER | System Cooling Capacity at Design Conditions (Btu/h) | Condenser Nominal Cooling Capacity  (ton) |
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| **J. Installed Duct System information** | | | | | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 |
| SC System ID/Name from CF1R | SC System Description of Area Served | Indoor Unit Name or Description of Area Served | Supply Duct Location | Supply Duct  R-Value | Return Duct Location | Return Duct  R-Value | Exception from Min R-Value | Method of compliance with Airflow and Fan Efficacy Req's in 150.0(m)13 | Bypass Duct Status | Number of Air Filter Devices on Indoor Unit | Can Approved Airflow Protocols be used to test this System? | Can Approved Fan Efficacy Protocol be used to test this system? | Total Duct Length |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| **K. Installed Air Filter Device Information**  Mandatory requirements for air filter devices are specified Section 150.0(m)12. The installer shall place a sticker in or near the filter grille displaying the filter grille/rack design airflow rate and the maximum allowed clean filter pressure drop at the design airflow rate. This will inform the occupant of the airflow vs pressure drop performance required for replacement air filters. | | | | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 |
| SC System ID/Name from CF1R | SC System Description of Area Served | Indoor Unit Name or Description of Area Served | Air Filter Name or Description of Location | Air Filter Device Type | Design Airflow Rate  for Air Filter Device  (cfm) | Air Filter Nominal Depth  (inch) | Air Filter Nominal Length  (inch) | Air Filter Nominal Width  (inch) | Air Filter  Calculated Nominal Face Area  (inch2) | Air Filter Required  Minimum Face Area  (inch2) | Face Area Compliance | Design Allowable Pressure Drop for Air Filter Device  (inch W.C.) |
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| **L. Air Filter Device Requirements** | |
| 01 | The system shall be designed to ensure that all recirculated air and all outdoor air supplied to the occupiable space is filtered before passing through the system's thermal conditioning components. |
| 02 | The system shall be designed to accommodate the clean-filter pressure drop imposed by the system air filter device(s). The design airflow rate and maximum allowable clean-filter pressure drop at the design airflow rate applicable to each air filter shall be determined by the system designer. The system installer shall affix a sticker/label to each system air filter grille/rack location that discloses the filter's design airflow rate and the filter's maximum allowable clean-filter pressure drop at the design airflow rate. The sticker/label shall be permanently affixed to the air filter device, readily legible, and visible to a person replacing the air filter. |
| 03 | All system air filter devices shall be located and installed in such a manner as to allow access and regular service by the system owner. |
| 04 | The system shall be provided with air filters having a designated efficiency equal to or greater than MERV 13 when tested in accordance with ASHRAE Standard 52.2, or a particle size efficiency rating equal to or greater than 50% in the 0.30-1.0 μm range and equal to or greater than 85 percent in the 1.0-3.0 μm range when tested in accordance with AHRI Standard 680. |
| 05 | The system shall be provided with air filters that have been labeled by the manufacturer to disclose efficiency and pressure drop ratings that conform to the efficiency and pressure drop requirements for the air filter grilles/racks. |
| **The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.** | |

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| **M. HERS Verification Requirements for Duct Systems** | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 |
|  |  |  | MCH-20 | MCH-21 | MCH-22 | MCH-23 | MCH-28 | MCH-29 | MCH30 |
| SC System ID/Name from CF1R | SC System Description of Area Served | Indoor Unit Name or Description of Area Served | Duct Leakage Test | Duct Location Verification | AHU Fan Efficacy (W/cfm) | AHU Airflow Rate  (cfm/ton) | Return Duct Design - Table 150.0-B or C | Supply Duct Surface Area R-Value Buried Ducts | Central Fan Ventilation Cooling Credit |
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| **N. HERS Verification Requirements for Space Conditioning Equipment** | | | | |
| 01 | 02 | 03 | 04 | 05 |
|  |  | MCH-25 | MCH-26 | MCH-33 |
| SC System ID or Name from CF1R | SC System Description of Area Served | Refrigerant Charge | Rated SC System  Equipment Verification | VCHP Compliance Credit |
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| Notes: | | | | |

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| **O. Space Conditioning Systems, Ducts and Fans – Mandatory Requirements and Additional Measures**  Additional mandatory requirements from Section 150.0 that are not listed here may be applicable to some systems. These requirements may be applicable to only newly installed equipment or portions of the system that are altered. Existing equipment may be exempt from these requirements. | |
| **Heating Equipment** | |
| 01 | Equipment Efficiency: All heating equipment must meet the minimum efficiency requirements of Section 110.1 and Section 110.2(a) and the Appliance Efficiency Regulations. |
| 02 | Controls: All unitary heating systems, including heat pumps, must be controlled by a setback thermostat. These thermostats must be capable of allowing the occupant to program the temperature set points for at least four different periods in 24 hours. See Sections 150.0(i), 110.2(b). |
| 03 | Sizing: Heating load calculations must be done on portions of the building served by new heating systems to prevent inadvertent undersizing or oversizing. See sections 150.0(h)1 and 2). |
| 04 | Furnace Temperature Rise: Central forced-air heating furnace installations must be configured to operate at or below the furnace manufacturer's maximum inlet-to-outlet temperature rise specification. See Section 150.0(h)4. |
| 05 | Standby Losses and Pilot Lights: Fan-type central furnaces may not have a continuously burning pilot light. Section 110.5 and Section 110.2(d). |
| **Cooling Equipment** | |
| 06 | Equipment Efficiency: All cooling equipment must meet the minimum efficiency requirements of Section 110.1 and Section 110.2(a) and the Appliance Efficiency Regulations. |
| 07 | Refrigerant Line Insulation: All refrigerant line insulation in split system air conditioners and heat pumps must meet the R-value and protection requirements of Section 150.0(j)2 and 3, and Section 150.0(m)9. |
| 08 | Condensing Unit Location: Condensing units shall not be placed within 5 feet of a dryer vent outlet. See Section 150.0(h)3A. |
| 09 | Liquid Line Filter Drier: A liquid line filter drier shall be installed according to the manufacturer’s specifications 150.0(h)3B. |
| 10 | Sizing: Cooling load calculations must be done on portions of the building served by new cooling systems to prevent inadvertent undersizing or oversizing. See Section 150.0(h)1 and 2. |
| **Air Distribution System Ducts, Plenums and Fans** | |
| 11 | Insulation: The minimum duct insulation value is R-6. Note that higher values may be required by the prescriptive or performance requirements. See Section 150.0(m)1. |
| 12 | Connections and Closures: All installed air-distribution system ducts and plenums must meet the requirements of CMC Sections 601.0, 602.0, 603.0, 604.0, 605.0 and ANSI/SMACNA-006-2006: Supply-air and return-air ducts and plenums must be insulated to a minimum installed level of R-6.0, otherwise a minimum of R-4.2 is allowed if the system is enclosed entirely in conditioned space as confirmed through field verification and diagnostic testing in accordance with the requirements of Reference Residential Appendix RA3.1.4.3.8. Exceptions for ducts in interior wall cavities or exposed ducts entirely in conditioned space are specified in Section 150.0(m)1B. |
| **Heat Pump Thermostat** | |
| 13 | A thermostat shall be installed that meets the requirements of Section 110.2(b) and Section 110.2(c). |
| 14 | The thermostat shall be installed in accordance with the manufacturers published installation specifications. |
| 15 | First stage of heating shall be assigned to heat pump heating. |
| 16 | Second stage back up heating shall be set to come on only when the indoor set temperature cannot be met. |
| **The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.** | |

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| **Documentation Author's Declaration Statement** | | | |
| 1. I certify that this Certificate of Installation documentation is accurate and complete. | | | |
| Documentation Author Name: | | Documentation Author Signature: | |
| Documentation Author Company Name: | | Date Signed: | |
| Address: | | CEA/HERS Certification Identification (if applicable): | |
| City/State/Zip: | | Phone: | |
| **Responsible Person's Declaration statement** | | | |
| I certify the following under penalty of perjury, under the laws of the State of California:   1. The information provided on this Certificate of Installation is true and correct. 2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person’s behalf. 3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency. 4. I understand that a HERS rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner. 5. I will ensure that a registered copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. | | | |
| Responsible Builder/Installer Name: | Responsible Builder/Installer Signature: | | |
| Company Name: (Installing Subcontractor or General Contractor or Builder/Owner) | Position With Company (Title): | | |
| Address: | CSLB License: | | |
| City/State/Zip: | Phone: | | Date Signed: |
| Third Party Quality Control Program (TPQCP) Status: | Name of TPQCP (if applicable): | | |

**CF2R-MCH-01a-E User Instructions**

**Section A. General Information**

1. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
2. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. When the project scope includes an addition to an existing building, the value is equal to the sum of the existing conditioned floor area plus the conditioned floor area of the addition. The default value from the CF1R-PRF may be overwritten in this document. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
4. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
5. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
6. Oversized equipment can result in reduced efficiency and capacity. Entirely new systems must be properly sized to match the heating and cooling load of the space that it serves. To do this, heating and cooling load calculations must be performed using an approved calculation methodology. These are listed here. Select the load calculation methodology used for this dwelling unit. If the project consists of a partial replacement of equipment or ducts (change-out) then load calculations are not required. Select N/A. Load calculations are always recommended, especially if the loads of the house have been changed since the original equipment has been installed (reduced via weatherization, other improvements).
7. Enter the total sensible cooling load for the dwelling unit described by this document. For projects involving dwelling units with more than one system, this will be a sum of the loads for the parts of the dwelling unit served by those systems. If the project consists of a partial replacement of equipment or ducts (change-out) then load calculations are not required. Select N/A.
8. Enter the total heating load for the dwelling unit described by this document. For projects involving dwelling units with more than one system, this will be a sum of the loads for the parts of the dwelling unit served by those systems. If the project consists of a partial replacement of equipment or ducts (change-out) then load calculations are not required. Select N/A.
9. Enter the number of bedrooms in the dwelling unit. This field is filled out automatically using the default value from the CF1R-PRF for performance compliance, and is user entry for prescriptive compliance. The default value from the CF1R-PRF may be overwritten in this document. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.

**Section B. Design Space Conditioning (SC) System Component Specifications from CF1R**

1. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
2. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
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8. This field is filled out automatically. It is determined based on entries on the Certificate of Compliance (CF1R), which must be completed prior to this document.
9. This field is filled out automatically. It is determined based on entries on the Certificate of Compliance (CF1R), which must be completed prior to this document.
10. This field is filled out automatically. It is determined based on entries on the Certificate of Compliance (CF1R), which must be completed prior to this document.
11. This field is filled out automatically. It is determined based on entries on the Certificate of Compliance (CF1R), which must be completed prior to this document.

**Section C. Design Space Conditioning (SC) System Compliance Requirements from CF1R**

1. This field is filled out automatically. It is referenced from the same row and column in the previous section.
2. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
4. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
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12. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.

**Section D. Installed Space Conditioning (SC) System Component Information**

1. Select System name from the list of systems identified in previous sections and originally specified on the CF1R.
2. Briefly describe the area served by this system. Examples: entire house, upstairs, downstairs, sleeping area, north wing, etc.
3. Enter the conditioned floor area served by the system described in this row. The total value of this column for all rows must equal the total dwelling unit conditioned floor area as shown in Section A.
4. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
5. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
6. If the space conditioning system is a multiple-split system, then enter the number of ducted/ductless indoor units (AHU) connected to the outdoor unit. If the system is a type that does not have an outdoor unit, such as a heating-only type that uses only a furnace air-handling unit, enter 1 for the number of indoor units (The furnace air-handling unit is an indoor unit).
7. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
8. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
9. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
10. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.

**Section E. Installed Heating Equipment Information (not heat pumps)**

1. This field is filled out automatically. It is referenced from the same row and column in the previous section.
2. This field is filled out automatically. It is referenced from the same row and column in the previous section.
3. Enter a brief name or description of the indoor unit area served. Examples: Master Bedroom, Dining Room, Living Room, etc
4. If the indoor unit is used to bring outdoor air into the dwelling, the system may be used to comply with the IAQ mechanical ventilation requirements. This is called central fan integrated ventilation (CFI). Systems that have only one indoor unit may use CFI ventilation if yes is selected in this field. Systems in multifamily dwellings, and systems with more than one indoor unit connected to one outdoor unit may not select yes.
5. Enter the description of the duct system on this indoor unit. The possible choices are Ductless; Ducted >10ft length, Ducted ≤10ft length.
6. This field is filled out automatically. It is referenced from the same row and column in Section C.
7. Enter the certified heating efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
8. Enter the name of the *installed* Heating Unit Manufacturer as shown on the equipment nameplate.
9. Enter the name of the *installed* Heating Unit Model Number as shown on the equipment nameplate.
10. Enter the name of the *installed* Heating Unit Serial number as shown on the equipment nameplate.
11. Enter the rated heating capacity (output) of the *installed* Heating Unit in BTUs per hour.

**Section F. Installed Cooling System Outdoor Unit or Package Unit Equipment Information (not heat pump)**

1. This field is filled out automatically. It is referenced from the same row and column in the previous section.
2. This field is filled out automatically. It is referenced from the same row and column in the previous section.
3. Enter the certified cooling efficiency (SEER) of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
4. Enter the certified cooling efficiency (EER) of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
5. Enter the name of the *installed* Condenser or Package Unit Manufacturer as shown on the equipment nameplate.
6. Enter the name of the *installed* Condenser or Package Unit Model Number as shown on the equipment nameplate.
7. Enter the name of the *installed* Condenser or Package Unit Serial Number as shown on the equipment nameplate.
8. Enter the sensible cooling capacity at design conditions of the *installed* cooling system in BTUs per hour. This information is found in the system performance information on the manufacturer's published documentation for the installed system.
9. Enter the *installed* Condenser Nominal Cooling Capacity in tons. Note that this is based on the condenser, not the coil or air handler. This can usually be determined by the condenser model number.
10. Enter the *installed* Condenser Rated Cooling Capacity in BTU/h. Note that this is based on the condenser, not the coil or air handler.

**Section G. Installed Split System Indoor Unit Coil or Fan Coil Equipment information - applicable to DX or hydronic, heating or cooling, coils or fan coil units)**

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. Enter a brief name or description of the indoor unit area served. Examples: Master Bedroom, Dining Room, Living Room, etc..
4. Enter the type of indoor unit or air handling unit installed by selecting one of the choices from the list.
5. Enter the description of the ducts system on this indoor unit. The possible choices are Ductless; Ducted >10ft length, Ducted ≤10ft length.
6. If the indoor unit is used to bring outdoor air into the dwelling, the system may be used to comply with the IAQ mechanical ventilation requirements. This is called central fan integrated ventilation (CFI). Systems that have only one indoor unit may use CFI ventilation if yes is selected in this field. Systems in multifamily dwellings, and systems with more than one indoor unit connected to one outdoor unit may not select yes.
7. Enter the name of the *installed* Indoor Coil or Fan Coil Unit Manufacturer as shown on the equipment nameplate.
8. Enter the name of the *installed* Indoor Coil or Fan Coil Unit Model Number as shown on the equipment nameplate.
9. Enter the name of the *installed* Indoor Coil or Fan Coil Unit Serial Number as shown on the equipment nameplate.
10. Enter the indoor unit cooling capacity if the indoor unit is one of the ducted variable capacity heat pumps types, otherwise this field is not needed.

**Section H. Installed Heat Pump System – Split System Condensing Unit or Package Unit Equipment Information**

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. Enter the name of the *installed* Heat Pump Condenser or Package Unit Manufacturer as shown on the equipment nameplate.
4. Enter the name of the *installed* Heat Pump Condenser or Package Unit Model Number as shown on the equipment nameplate.
5. Enter the name of the *installed* Heat Pump Condenser or Package Unit Serial Number as shown on the equipment nameplate.

**Section I. Installed Heat Pump System – Efficiency and Performance Compliance Information**

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row in Section C.
4. Enter the certified heating efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
5. Enter the certified heating capacity at 47F of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed capacity must be greater than or equal to the required minimum capacity.
6. Enter the certified heating capacity at 17F of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed capacity must be greater than or equal to the required minimum capacity.
7. Enter the certified cooling efficiency (SEER) of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
8. Enter the certified cooling efficiency (EER) of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
9. Enter the sensible cooling capacity at design conditions of the *installed* cooling system in BTUs per hour.
10. Enter the *installed* Condenser Rated Nominal Cooling Capacity in tons. Note that this is based on the condenser, not the coil or air handler. Can usually be determined by the condenser model number.

**Section J. Installed Duct System Information**

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
4. This field is filled out automatically. It appears in Section B and D, and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
5. Enter the R-value of the *installed* supply ducts. This value is verified against the minimum value shown in Section C. The installed R-value must be greater than or equal to the required minimum R-value.
6. This field is filled out automatically. It appears in Section B and D, and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
7. Enter the R-value of the *installed* return ducts. This value is verified against the minimum value shown in Section C. The installed R-value must be greater than or equal to the required minimum R-value.
8. The duct system may be qualified for exemptions from the minimum R-value requirement if all of the ducts are located entirely within conditioned space. There are also exemptions for ducts located in interior wall cavities, and for ducts located entirely in conditoned space. The user may select from available choices to indicate the exemption. Note: Selecting Ducts ≥R4.2 entirely in conditioned space will subject the duct system to additional HERS verification.
9. For newly constructed systems taking the performance credit for better than default air flow or fan efficacy, field verification of these criteria is required and this field is filled out automatically. Otherwise, the user may pick the appropriate choice. Refer to section 150.0(m)13 and Residential Compliance Manual Chapter 4.4 for more information.
10. This field is filled out automatically. It appears in Section B, and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
11. Specify the number of air filter devices installed in this indoor unit's duct system. Air filter devices installed in completely new systems must be properly sized, as documented in the next section. The value entered here will determine the number of rows needed in the following section.
12. If the system is of a type that can use one of the approved protocols for testing the airflow rate, then enter yes. Otherwise enter no. Note: that the protocol in RA3.3.3.1.5 (Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems) is not one of the protocols that is allowed to be used to justify a "yes" to this question.
13. If the system is of a type that can use the approved protocol protocols for verifying the indoor unit's fan efficacy, then answer yes. Otherwise answer no
14. This field is filled out automatically for some system types. Otherwise select the value that describes the length of the duct system.

**Section K. Installed Air Filter Device Information**

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections
3. This field is filled out automatically. It is referenced from the same row and column in the previous sections
4. Enter a descriptive name of each air filter device so that it may be distinguished from others in the same system. Examples: FG1, filter2, etc.
5. Select the appropriate type of filter device from the list.
6. Enter the design flow in CFM of the filter device. The total for all filter devices in a single system should be greater than or equal to the total system design CFM in cooling mode (or heating mode for heat-only systems).
7. Enter the nominal depth of the filter in inches. This is the dimension that is parallel to the airflow. many filters available for sale are 1-inch depth. The 2019 standards encourages use of 2-inch depth filters.
8. Enter the nominal length of the filter. for example, if the filter is 20" x 30", enter 30.
9. Enter the nominal width of the filter, for example, if the filter is a 20" x 30", enter 20.
10. This field is calculated automatically based on your entries in 8 and 9.
11. This value is calculated automatically for 1-inch depth filters. 2-inch depth or greater filters may use a value determined by the system designer.
12. This field determines whether a 1-inch depth filter complies with the sizing requirements in section 150.0(m)12. A 2-inch depth or greater filter may use the face area determined by the system designer, however most systems have to meet airflow rate and fan efficacy requirements.
13. Enter the design static pressure drop determined by the system designer if 2-inch or greater filters are used. For 1-inch depth filters, the maximum pressure drop is mandatory 0.1 inch W.C.. Filters installed in the filter grille/rack must be capable of meeting this maximum pressure drop at the design airflow rate, as shown on the manufacturer's filter label. Not accounting for higher filter pressure drops will result in poor system airflow characteristics, reduced capacity and reduced efficiency. This may result in not passing field verification.

**Section L. Air Filter Device Requirements**

This table is a list of requirements for air filter devices.

**Section M. HERS Verification Requirements for Duct Systems**

1. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
2. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
3. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
4. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
5. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
6. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
7. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
8. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
9. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
10. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.

**Section N. HERS Verification Requirements for Space Conditioning Equipment**

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections
3. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
4. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
5. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.

**Section O. Space Conditioning Systems, Ducts and Fans – Mandatory Requirements and Additional Measures**

This table is a list of mandatory measures and additional requirements for space conditioning systems, ducts and fans.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **A. General Information** | | | | | |
| 01 | Dwelling Unit Name | <<reference text from CF1R >> | 02 | Climate Zone | << reference text from CF1R>> |
| 03 | Dwelling Unit Total Conditioned Floor Area (ft2) | <<numeric: xxxxx;  **if1 parent is CF1R-PRF**, then  if2 project scope = Newly Constructed (Addition Alone)  then prompt user to enter a value equal to dwelling unit  existing CFA + addition CFA  else reference the value from CF1R endif2  **elseif parent is CF1R-NCB-01**, then  **if3 project scope = New Addition greater than 1,000 ft2**  then prompt user to enter a value equal to dwelling unit  existing CFA + addition CFA  **elseif project scope = Newly Constructed Building, then**  if4 building type = Single Family, then  reference value from CF1R-NCB field A10  elseif Building Type=Multifamily, then  reference value from CF1R-NCB field M02 endif4  endif3  **elseif parent is CF1R-ADD-01**, then  if5 building type= Single Family, then  reference value from field A08 from the CF1R-ALT-02 that is  required for the dwelling unit according to CF1R-ADD-01  Section J.  elseif Building Type=Multifamily, then  reference value from field A08 from the CF1R-ALT-02 that is  required for the dwelling unit according to CF1R-ADD-01  Section L. endif5  **elseif parent is CF1R-ALT-01**, then  if6 building type= Single Family, then  reference value from field A08 from the CF1R-ALT-02 that is  required for the dwelling unit according to CF1R-ALT-01  Section G.  **elseif Building Type=Multifamily, then**  reference value from field A08 from the CF1R-ALT-02 that is  required for the dwelling unit according to CF1R-ALT-01  Section letter I. endif6  elseif parent is CF1R-ALT-02, then  reference value from CF1R-ALT-02 field A08. endif1  allow user to override default and input a value; flag overridden values and report in project status notes field >> | 04 | Number of Space Conditioning Systems in this Dwelling Unit | <<integer: xx; If parent is CF1R-ALT-02 doc type, then use as default the value referenced from CF1R ALT-02 Section A (field A10); or allow user to override the default and input a new value; flag non-default values and report in project status notes field;  elseif parent is not CF1R-ALT-02 doc type, then user input the integer value>> |
| 05 | Certificate of Compliance Type | << reference document type property from CF1R: allowed values: performance (CF1R-PRF); or prescriptive additions/alterations (CF1R-ADD/CF1R-ALT); or prescriptive newly constructed (CF1R-NCB)>> | 06 | Method Used to Calculate HVAC Loads | <<user select from list:  \*ASHRAE Handbook;  \*SMACNA Residential Comfort System Installation Standards Manual;  \*ACCA Manual J  \*n/a equipment changeout, like-for-like>> |
| 07 | Calculated Dwelling Unit Sensible Cooling Load (Btu/h) | <<user entry: numeric: xxxxx (allow n/a entry if "n/a equipment changeout, like-for-like" is selected in A06) >> | 08 | Calculated Dwelling Unit Heating Load (Btu/h) | <<user entry: numeric: xxxxx (allow n/a entry if "n/a equipment changeout, like-for-like" is selected in A06) >> |
| 09 | Dwelling Unit Number of Bedrooms | <<<<calculated field: integer xx:  if CertComplianceType=performance, then use as default the value referenced from CF1R-PRF or allow user to override the default and input a new value constrained to be greater than or equal to the default value from the CF1R-PRF; flag non-default values and report in project status notes field;  elseif parent is not CF1R-PRF doc type, then user input the integer value xx>> | 10 | Determination of Mech01 type (this field not visible to user) | <<calculated field:  if1 CertComplianceType=performance, then  if2 CF1R-PRF Project Scope=one of the  following two types:  \*\*Addition and/or Alteration  \*\*Newly Constructed - Addition Alone  then display doc variation MCH-01d;  elseif CF1R-PRF Project Scope=Newly  Constructed,  then display doc variation MECH01a  endif2  elseif CertComplianceType=prescriptive additions/alterations,  then display doc variation MECH01b,  elseif CertComplianceType=prescriptive newly constructed,  then display doc variation MECH01c  (this field not visible to user) endif1>> |

|  |
| --- |
| **MCH-01a – Space Conditioning Systems Ducts and Fans - For use with Performance Certificate of Compliance** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **B. Design Space Conditioning (SC) System Component Specifications from CF1R**  This table reports the space conditioning system features that were specified on the registered CF1R-PRF compliance document for this project.  <<require one row of data for each SC System identified on the CF1R report that is applicable to this dwelling unit; do not allow user to overwrite these referenced data >> | | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 |
| SC System ID/Name from CF1R | SC System Type | Heating System Type | Cooling System Type | Central Fan Ventilation Cooling System Type | Distribution System Type | Required  Thermostat Type | Low Leakage Air-Handling Unit Status | Bypass Duct Status | Cooling Zoning Type | Cooling System Compressor Speed Type |
| <auto filled text: reference from CF1R>> | << auto filled text: referenced from CF1R>> | <<if on the CF1R, Y02\_ResidentialHeatingSystemType=VCHP, then allow user to select from list: \*VCHP-Ducted, \*VCHP-Ductless, \*VCHP-Ducted+Ductless; else autofill from CF1R>>  Note: assume the VCHP and multisplit system types will be included in CBECC, thus included in the allowed values in this field:  \*VCHP-ducted  \*VCHP-ductless  \*VCHP-ducted+ductless  \*multisplit HP-ducted  \*multisplit HP-ductless  \*multisplit HP-ducted+ductless  \*ducted mini-split HP | <<if on the CF1R, Y02\_ResidentialHeatingSystemType=VCHP, then allow user to select from list: \*VCHP-Ducted, \*VCHP-Ductless, \*VCHP-Ducted+Ductless; else autofill from CF1R>>  Note: assume the VCHP and multisplit system types will be included in CBECC, thus included in the allowed values in this field:  \*VCHP-ducted  \*VCHP-ductless  \*VCHP-ducted+ductless  \*multisplit AC-ducted  \*multisplit AC-ductless  \*multisplit AC-ducted+ductless  \*multisplit HP-ducted  \*multisplit HP-ductless  \*multisplit HP-ducted+ductless  \*ducted mini-split AC  \*ducted mini-split HP | <<if on the CF1R, Central Fan Vent Cooling credit is not claimed for this system or if value is not available from CF1R, then value=N/A, else autofill value from CF1R. allowed values are:  \*variable flow  \*fixed flow>> ' | <<auto filled text: referenced from CF1R>> | <<auto filled text referenced from CF1R>> | <<if on CF1R  LowLkgAH=true, then value=  \*Has Low Leakage Air Handler,  elsif LowLkgAH=false or if value is not available from CF1R, then value=  \*None | <<if on CF1R HasBypasss Duct=true, then value=  \*Has Bypass Duct,  else value=  \*None;  Elseif value is not available from CF1R, value = none >> | <<calculated field:  if cooling system type (B04) = NoCooling,  then display result=n/a  elseif on CF1R IsZonal=true then value =  \*Zonnaly Controlled  elsif IsZonal=false then value = \*Not Zonal  >> | << calculated field:  if cooling system type (B04) = NoCooling,  then display result=n/a  elseif on CF1R IsMultiSpeed=true, then value=  \*Multi-Speed ,  elsif IsMultiSpeed=false, then value=  \*Single Speed>> |
|  |  |  |  |  |  |  |  |  |  |  |
| Notes: | | | | | | | | | | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **C. Design Space Conditioning (SC) System Compliance Requirements from CF1R**  This table reports the space conditioning system features that were specified on the registered CF1R-PRF compliance document for this project.  <<require one row of data for each SC System listed in Section B; do not allow user to overwrite these referenced data>> | | | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 |
| SC System ID/ Name from CF1R | Heating  Efficiency  Type | Minimum  Heating  Efficiency  Value  (%) | Heat Pump Heating Capacity  @ 47°F | Heat Pump Heating Capacity  @ 17°F | Minimum  Cooling Efficiency  SEER | Minimum  Cooling Efficiency  EER | Minimum Cooling System Airflow Rate (CFM/ton) | Maximum  SC System Fan Efficacy (W/CFM ) | Modeled Duct R-Value | Central Fan  Ventilation  Cooling Airflow | Central Fan  Ventilation  Cooling  Fan Efficacy |
| <<auto filled text: referenced from B01>> | <<If B03 = ‘Combined Hydronic’ then report NA;  Else auto filled text: referenced from CF1R for this system name>> | <<If B03 = ‘Combined Hydronic’ then report NA;  Else auto filled text: referenced from CF1R for this system name>> | << auto filled text: referenced from CF1R for this system name if the data is available;  else if the system type on the CF1R does not provide this data,  then result=N/A >> | <<auto filled text: referenced from CF1R for this system name if the data is available;  else if the system type on the CF1R does not provide this data,  then result=N/A>> | <<auto filled text: referenced from CF1R for this system name if the data is available;  else if the system type on the CF1R does not provide this data,  then result=N/A >> | <<auto filled text: referenced from CF1R for this system name if the data is available;  else if the system type on the CF1R does not provide this data,  then result=N/A>> | <<auto filled text: referenced from CF1R for this system name if the data is available;  else if the system type on the CF1R does not provide this data,  then result=N/A>> | <<auto filled text: referenced from CF1R for this system name if the data is available;  else if the system type on the CF1R does not provide this data,  then result=N/A>> | <<calculated field: if CF1R flags requirement for a Verified Duct System Design, then display text:  Verified Duct  System Design  else reference the R-value from the CF1R for this system name if the data is available;  else if CF1R does not provide R-value data for this system,  then result=N/A>> | <<if B05=N/A, then value= N/A,  elseif B05= \*fixed flow"  then reference the fixed cool vent airflow value from the CF1R for this system,  elseif B05=  \*variable flow"  then value= the maximum cool vent airflow from the CF1R for this system>> | <<if B05=N/A, then value= N/A,  else reference the value from the CF1R for this system>> |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Notes: | | | | | | | | | | | |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **D. Installed Space Conditioning (SC) System Component Information**  << require one row of data to be entered in this table for each of the quantity of space conditioning systems entered in A04. If SC system names from CBECC are installed more than once in this dwelling unit, then duplicate SC System names are allowed in column D01; Require each entry in D02 (area served) to be unique in this dwelling unit>> | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 |
| SC System ID/Name from CF1R | SC System Description of Area Served | Conditioned Floor Area Served by the System (ft2) | Heating  System Type | Cooling  System Type | Number of Indoor Units Connected to the System's Outdoor Unit | Distribution System Type | SC System  Thermostat Type | Cooling Zoning Type | Cooling System Compressor Speed Type |
| << User select applicable system name from a list comprised of the systems identified in column B01; If SC system names from CBECC are installed more than once in this dwelling unit, then duplicate SC System names are allowed in this field >> | <<user input, text, 15 characters maximum;  Require each entry to be unique in this dwelling unit i.e. unique within the scope of this instance of the MCH-01>> | << user input, numeric, xxxx;  Require the sum of the values in this column to be equal to the value in A03 as condition of completion of the doc>> | <<reference value from B03 as default;  do not allow user to override the following default values from B03:  \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP-Ducted+Ductless  \*ductless mini-split HP;  \*ductless VRF HP;  \*ducted mini-split HP  \*small duct high velocity HP;  \*multisplit HP-ducted  \*multisplit HP-ductless  \*multisplit HP-ducted+ductless  \*room HP;  \*air-to-water HP  \*ground-source HP  otherwise allow user to override the default and pick one from list:  \*central gas furnace;  \*central split HP;  \*central packaged HP  \*central large packaged HP  \*boiler;  \*hydronic;  \*combined hydronic;  \*hydronic+forced air;  \*combined hydronic+forced air;  \*hydronic HP,  \*hydronic HP+forced air;  \*gas wall furnace;  \*gas space heater;  \*electric ;  \*Wood Heat;  \*Packaged gas furnace  flag non-default values and report in project status notes field; a revised CF1R may be required >> | <<reference value from B04 as default >>  note: allowed values in B04 may include:  \*central split AC;  \*central split HP  \*central packaged AC ;  \*central packaged HP  \*central large packaged AC ;  \*central large packaged HP  \*gas absorption AC  \*room AC;  \*room HP;  \*hydronic HP,  \*hydronic HP+forced air;  \*evaporative - direct  \*evaporative - indirect  \*evaporative - indirectdirect  \*evaporatively cooled condenser  \*Ice Storage AC  \*no cooling;  \*small duct high velocity AC  \*small duct high velocity HP  \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP-Ducted+Ductless  \*multisplit AC-ducted  \*multisplit AC-ductless  \*multisplit AC-ducted+ductless  \*multisplit HP-ducted  \*multisplit HP-ductless  \*multisplit HP-ducted+ductless  \*ductless mini-split AC;  \*ductless mini-split HP;  \*ductless VRF AC  \*ductless VRF HP;  \*ducted mini-split AC  \*ducted mini-split HP  \*air-to-water HP  \*ground-source HP  note: cooling system type "**No Cooling"** is the flag for heating-only system type | <<**if** [D04 or D05] = one of the following system types:  \*room HP  \*gas wall furnace;  \*gas space heater;  \*electric ;  \*Wood Heat;  \*Packaged gas furnace  \*central packaged AC ;  \*central packaged HP;  \*central large packaged AC;  \*central large packaged HP  \*room AC;  \*room HP;  \*evaporative - direct  \*evaporative - indirect  \*evaporative - indirectdirect  **then** text value=N/A,  elseif B05= one of the following two values:  \*variable flow  \*fixed flow,  then value=1,  elseif the CF1R requires use of a Central Fan Integrated (CFI) IAQ Ventilation system, then value=1,  else default integer value =1;  allow user to overwrite the default to enter one of the following two:  1:an integer value greater than 1;  2:text value=N/A >> | <<**if** D04=  \*VCHP-Ducted  **then** value in this field=  \*LowLlCod - Verified low-leakage ducts in conditioned space,  **elseif** D04=  \*VCHP-Ductless  **then** value in this field=  \*DuctsNone - Air distribution systems without ducts,  **elseif** D04=  \*VCHP-Ducted+Ductless  **then** value in this field=  \*Multiple split Indoor Units combined Ducted and Ductless.  else reference value from B06 as default. Allow user to overwrite only the following three default values from B06:  **\*DuctsAttic**  **\*DuctsGarage**  **\*DuctsOutdoor;**  If overriding pick one from list:  **\*DuctsAttic** - Ducts located overhead in unconditioned attic  **\*DuctsCrawl** - Ducts located underfloor in unconditioned crawl space  **\*DuctsGarage** - Ducts located in an unconditioned garage  **\*DuctsInEx12** - Ducts located within the conditioned space (except < 12 lineal ft)  **\*DuctsInAll** - HVAC system(s) with all HVAC ducts located in conditioned space  **\*DuctsNone** - Air distribution systems without ducts  **\*DuctsOutdoor** - Ducts located in exposed outdoor locations  **\*LowLlCod** - Verified low-leakage ducts in conditioned space  \***Ducts located in multiple places;**  \*Multiple split Indoor Units combined Ducted and Ductless.  flag non-default values and report in project status notes field; a revised CF1R may be required >> | <<reference value from B07 as default; allow user to override the default and pick one from list:  \*setback;  \*Occupant Controlled Smart Thermostat (OCST) per JA5;  \*Energy Management Control System (EMCS)>> | <<calculated field: reference value from B10 as default; else if cooling system type (D05) = NoCooling, then override default and display result=NA; else allow user to override the default and pick one from list: \*Zonally Controlled,  \*Not Zonal;  flag non-default values and report in project status notes field; a revised CF1R may be required>> | <<calculated field: reference value from B11 as default;  else:  if cooling system type (D05) = NoCooling,  then override default and display result=n/a;  else:  allow user to override the default and pick one from list:  \*Multi-Speed \*Single Speed  flag non-default values and report in project status notes field; a revised CF1R may be required>> |
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| **E. Installed Heating Equipment Information (not heat pumps).**  <<<if all of the SC Systems listed in Section D have a value in D04 = one of the heat pump types (see list that follows), then display the section does not apply message;  else for each of the SC Systems in section D for which the heating System Type listed in D04 ≠ one of the heat pump types in the list that follows below; do the following two actions:  **1:[**require one row of data for each of the SC systems in section D column D02 for which D06=N/A];  **2:**[for systems for which D06 ≥1, and D04= central gas furnace; require one row of data for each of the quantity of indoor units specified in D06 for that system]. | | | | | | | | | | | | | | |
| \*central split HP;  \*central packaged HP  \*central large packaged HP  \*ductless mini-split HP; | | | \*hydronic HP,  \*hydronic HP+forced air;  \*room HP;  \*ducted mini-split HP | | | \*small duct high velocity HP;  \*ductless VRF HP  \*air-to-water HP  \*ground-source HP | | | \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP-Ducted+Ductless | | | \*multisplit HP-ducted  \*multisplit HP-ductless  \*multisplit HP-ducted+ductless>> | | |
| 01 | 02 | 03 | | 04 | 05 | | 06 | 07 | | 08 | 09 | | 10 | 11 |
| SC System ID/Name from CF1R | SC System Description of Area Served | Indoor Unit Name or Description of Area Served | | Does Indoor Unit Provide CFI IAQ Ventilation? | Indoor Unit Duct Status | | Heating Efficiency  Type | Heating Efficiency  Value  (%) | | Heating Unit Manufacturer | Heating Unit Model Number | | Heating Unit Serial Number | Rated Heating Capacity, Output (Btu/h) |
| <<auto filled from D01>> | <<auto filled from D02>> | << **if** value in D06=N/A,  **then** value=N/A  **elseif** value in D06=1,  **then** value autofilled from D02;  else user input, text, 15 characters maximum;  as default, require value to be unique in this dwelling unit (i.e. unique within the scope of this instance of the MCH-01) except for the case when all the following three conditions are true:  1:[E01=G01]  2:[E02=G02]  3:[D04=central gas furnace]  allow user to override the default uniqueness rule if necessary>> | | <<**if** D06 > 1, then value=no;  **elseif** building type on the CF1R= multifamily,  **then** value=no,  **elseif** IAQ vent system type for this dwelling on the CF1R=one of the following three,  \*Balanced,  \*Balanced ERV  \*Balanced HRV  **then** value=no,  elseif D06=N/A,  and D04=Packaged gas furnace,  then user pick one from list:  \*Yes  \*No  else, user pick one from list:  \*Yes  \*No>> | << if the distribution system type value in D07 =DuctsNone,  then value=Ductless;  elseif, D07=one of the  Ducted types:  \*DuctsAttic,  \*DuctsCrawl,  \*DuctsGarage,  \*DuctsInEx12,  \*DuctsInAll,  \*DuctsOutdoor,  \*LowLlCod,  \*Ducts located in multiple places,  then user pick one of the following two values:  \*Ducted>10ft length  \*Ducted ≤10ft length  else, if D07=-  \*Multiple split Indoor Units Mixed Ducted and Ductless,  then user pick one of the following three values:  \*Ductless  \*Ducted >10ft length  \*Ducted ≤10ft length>> | | <<reference value from C02; note: values may be  \*AFUE;  \*COP;  \*HSPF; or  \*NA  >> | <<**If** C03 = NA, **then** report NA; else user input, numeric, 100.0≥xx.x≥0.0; **and** check value must be ≥ value in C03, to comply; else flag non-compliant value and do not allow registration to proceed >> | | <<user input alphanumeric text string max 50 characters>> | <<user input alphanumeric text string max 50 characters>> | | <<user input alphanumeric text string max 50 characters>> | <<user input, numeric, xxxxxx>> |
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| Notes: | | | | | | | | | | | | | | |

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| **F. Installed Cooling System Outdoor Condensing Unit or Package Unit Equipment Information (not heat pumps)**  << **if** all of the SC Systems listed in Section D have a value in D05= No Cooling, then display the section does not apply message;  **else** require one row of data to be entered in this table for each of the SC Systems listed in Section D for which D05≠no cooling and the Cooling System Type listed in D05 ≠ one of the heat pump types in the following list: | | | | | | | | | | | | | |
| \*central split HP;  \*central packaged HP  \*central large packaged HP  \*ducted mini-split HP | | | \*ductless mini-split HP;  \*hydronic HP,  \*hydronic HP+forced air;  \*room HP; | | \*small duct high velocity HP;  \*ductless VRF HP  \*air-to-water HP  \*ground-source HP | | | \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP-Ducted+Ductless | | | \*multisplit HP-ducted  \*multisplit HP-ductless  \*multisplit HP-ducted+ductless>> | | |
| 01 | 02 | 03 | | 04 | | 05 | 06 | | 07 | 08 | | 09 | 10 |
| SC System ID/Name from CF1R | SC System Description of Area Served | Cooling Efficiency  SEER | | Cooling Efficiency  EER | | Condenser or Package Unit Manufacturer | Condenser or Package Unit Model Number | | Condenser or Package Unit  Serial Number | System Cooling Capacity at Design Conditions (Btu/h) | | Condenser Nominal Cooling Capacity  (ton) | Condenser  Rated Cooling Capacity  (Btu/h) |
| <<auto filled from D01>> | <<auto filled from D02>> | << **if** value in C06=N/A,  **then** result=NA;  **else** prompt user to input numeric value, xx.x;  **and check** value must be ≥ value in C06, to comply; else flag non-compliant value and do not allow registration to proceed>> | | << **if** value in C07=N/A,  **then** result=NA;  **else** prompt user to input, numeric value, xx.x;  **and check** value must be ≥ value in C07, to comply; except if one of the following two conditions are applicable:  cond 1:  **if** B04 = {central packaged AC},  **and** 12.2 > value ≥11.0,  **then** the system complies;  cond 2: if B04 = "central split AC", and F10 < 45000, then value must be ≥ 12.2 to comply.  else flag non-compliant value and do not allow registration to proceed>> | | <<user input alphanumeric text string max 50 characters>> | <<user input alphanumeric text string max 50 characters>> | | <<user input alphanumeric text string max 50 characters>> | <<user input, numeric, xxxxxx>> | | <<user input, numeric, x.xx>> | <<user input, numeric, xxxxxx>> |
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| Notes: | | | | | | | | | | | | | |

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| **G. Installed Split System Indoor Unit (Coil or Fan Coil) Equipment Information - applicable to DX or hydronic, heating or cooling, coils and fan coil units.**  Systems with more than one indoor coil or fan coil unit (e.g. multi-split systems) shall provide information for each of the system indoor unit coils or fan coil units.  <<**if** none of the SC Systems listed in Section D have a value in either D04 or D05 = one of the system types in the list that follows below, **then** display the section does not apply message;  **else** for each of the SC Systems listed in Section D for which one of the System Types listed in either D04 or D05 is one of the system types in the list that follows below, require one row of data to be entered in this table for each of the quantity of indoor units specified in D06 for that system. | | | | | | | | | | | | | | | |
| \*central split AC;  \*central split HP  \*ductless mini-split AC;  \*ductless mini-split HP;  \*ducted mini-split HP | | | \*hydronic + forced air;  \*combined hydronic + forced air;  \*hydronic HP+forced air;  \*gas absorption AC;  \*ducted mini-split AC | | \*evaporatively cooled condenser;  \*Ice Storage AC;  \*small duct high velocity AC;  \*small duct high velocity HP; | | | \*ductless VRF AC;  \*ductless VRF HP;  \*air-to-water HP  \*ground-source HP | | \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP-Ducted+Ductless | | \*multisplit AC-ducted+ductless  \*multisplit AC-ducted  \*multisplit AC-ductless | | \*multisplit HP-ducted  \*multisplit HP-ductless  \*multisplit HP-ducted+ductless>> | |
| 01 | 02 | 03 | | 04 | | 05 | 06 | | 07 | | 08 | | 09 | | 10 |
| SC System ID/Name from CF1R | SC System Description of Area Served | Indoor Unit Name or Description of Area Served | | Indoor Unit Type | | Indoor Unit Duct Status | Does Indoor Unit Provide CFI IAQ Ventilation? | | Indoor Unit Manufacturer | | Indoor Unit Model Number | | Indoor Unit Serial Number | | Indoor Unit Nominal Cooling Capacity (ton) |
| <<auto filled from D01>> | <<auto filled from D02>> | <<**if** value in D06≥ 1,  **and** ALL of the following three conditions are true: 1:[E01=G01]  2:[E02=G02]  3:[D04=central gas furnace]  **then** value = same value as E03;  **elseif** value in D06=1,  **then** value autofilled from D02;  **else** user input, text, 15 characters maximum;  as default, require value to be unique in this dwelling unit (i.e. unique within the scope of this instance of the MCH-01), except for the case when all the following three conditions are true: 1:[E01=G01]  2:[E02=G02]  3:[D04=central gas furnace]  allow user to override the default uniqueness rule if necessary>> | | <<user pick from list:  \*HP coil  \*AC Coil  \*fancoil AHU  \*non-furnace AHU+coil>> | | <<**if** value in D06≥ 1,  **and** ALL of the following three conditions are true: 1:[E01=G01]  2:[E02=G02]  3:[D04=central gas furnace]  **then** value = same value as E05;  **elseif** the distribution system type value in D07 =DuctsNone,  then value=Ductless;  **elseif**, D07=one of the  Ducted types: \*DuctsAttic, \*DuctsCrawl, \*DuctsGarage, \*DuctsInEx12, \*DuctsInAll, \*DuctsOutdoor, \*LowLlCod,  \*Ducts located in multiple places,  **then** user pick one of the following two values:  \*Ducted>10ft length  \*Ducted ≤10ft length  **else**, if D07=-  \*Multiple split Indoor Units Mixed Ducted and Ductless,  then user pick one of the following three values:  \*Ductless  \*Ducted >10ft length  \*Ducted ≤10ft length>> | <<**if** value in D06≥ 1,  **and** ALL of the following three conditions are true: 1:[E01=G01]  2:[E02=G02]  3:[D04=central gas furnace]  **then** value = same value as E04;  **elseif** D06> 1, then value=no;  **elseif** building type on the CF1R= multifamily, then value=no,  **elseif** IAQ vent system type for this dwelling on the CF1R= Balanced,  then value=no,  **else**, user pick one from list:  \*Yes  \*No>> | | <<user input alphanumeric text string max 50 characters>> | | <<user input alphanumeric text string max 50 characters>> | | <<user input alphanumeric text string max 50 characters>> | | <<**if** the following three conditions are ALL true:  condition 1:[D06 > 1],  condition 2:[system type in D04 or D05=one of the following two values:  {VCHP-Ducted},  {VCHP -Ducted+Ductless}]  condition 3:[G05= one of the following two values:  {Ducted >10ft length}  {Ducted ≤10ft length}]  **then**  user input numeric value, x.xx,  **else** display text: "value not required">> |
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| Notes: | | | | | | | | | | | | | | | |

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| **H. Installed Heat Pump System – Split System Condensing Unit or Package Unit Equipment Information**  <<<**if** none of the SC Systems listed in Section D have a value in D04 or D05 = one of the heat pump types (see list that follows), **then** display the section does not apply message; **else** require one row of data to be entered in this table for each of the SC Systems for which the Cooling System Type listed in D04 or D05 = one of the heat pump types in the following list:  \*central split HP;  \*central packaged HP  \*central large packaged HP  \*ductless mini-split HP;  \*ducted mini-split HP  \*room HP  \*hydronic HP,  \*hydronic HP+forced air;  \*small duct high velocity HP;  \*ductless VRF HP  \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP-Ducted+Ductless  \*multisplit HP-ducted  \*multisplit HP-ductless  \*multisplit HP-ducted+ductless  \*air-to-water HP  \*ground-source HP>> | | | | |
| 01 | 02 | 03 | 04 | 05 |
| SC System ID/Name from CF1R | SC System Description of Area Served | Condenser or Package Unit Manufacturer | Condenser or Package Unit Model Number | Condenser or Package Unit  Serial Number |
| <<auto filled from D01>> | <<auto filled from D02>> | <<user input alphanumeric text string max 50 characters>> | <<user input alphanumeric text string max 50 characters>> | <<user input alphanumeric text string max 50 characters>> |
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| Notes: | | | | |

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| **I. Installed Heat Pump System – Efficiency and Performance Compliance Information**  <<<if none of the SC Systems listed in Section D have a value in D04 or D05 = one of the heat pump types (see list that follows), then display the section does not apply message; else require one row of data to be entered in this table for each of the SC Systems for which the Cooling System Types listed in D04 or D05 = one of the heat pump types in the following list: | | | | | | | | | | | |
| \*central split HP;  \*central packaged HP  \*central large packaged HP  \*ducted mini-split HP | | \*ductless mini-split HP;  \*hydronic HP,  \*hydronic HP+forced air;  \*room HP | | \*small duct high velocity HP;  \*ductless VRF HP  \*air-to-water HP  \*ground-source HP | | | \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP-Ducted+Ductless | | \*multisplit HP-ducted  \*multisplit HP-ductless  \*multisplit HP-ducted+ductless>> | | |
| 01 | 02 | 03 | 04 | | 05 | 06 | 07 | 08 | | 09 | 10 |
| SC System ID/Name from CF1R | SC System Description of Area Served | Heating Efficiency Type | Heating Efficiency Value | | System Rated  Heating Capacity at 47°F | System Rated  Heating Capacity at 17°F | System Rated  Cooling Efficiency  SEER | System Rated  Cooling Efficiency  EER | | System Cooling Capacity at Design Conditions (Btu/h) | Condenser Nominal Cooling Capacity  (ton) |
| <<auto filled from D01>> | <<auto filled from D02>> | <<reference value from C02; note: values may be  \*AFUE;  \*COP;  \*HSPF; or  \*NA>> | <<**If** C03 = NA, then report NA;  Else user input, numeric, 100.0≥xx.x≥0.0;  **and** for all systems except for those with a value in D04= one of the following three:  \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP-Ducted+Ductless,  **check** value must be ≥ value in C03 to comply; else flag non-compliant value and do not allow registration to proceed>> | | << if value in C04=N/A, then result=NA;  else user input, numeric, xx.x; check value must be ≥ value in C04 to comply;  else flag non-compliant value and do not allow registration to proceed>> | << if value in C05=N/A, then result=NA; else prompt user to input one of the following 2 options:  1: user select text value="Certification Directory Does Not Report a Value"  2: user enter numeric value, xx.x; and check value must be ≥ value in C05 to comply;  else flag non-compliant value and do not allow registration to proceed>> | << if value in C06=N/A, then result=NA;  else user input, numeric, xx.x;  and for all systems except for those with a value in [D04 or D05] = one of the following three:  \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP-Ducted+Ductless,  check value must be ≥ value in C06, to comply; else flag non-compliant value and do not allow registration to proceed>> | << if value in C07=N/A, then result=NA;  else user input, numeric, xx.x;  and for all systems except for those with a value in [D04 or D05]= one of the following three:  \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP-Ducted+Ductless,  check value must be ≥ value in C07 to comply; else flag non-compliant value and do not allow registration to proceed>> | | <<user input, numeric, xxxxxx>> | <<user input, numeric, x.x>> |
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| **J. Installed Duct System information**  <<**if** all of the SC Systems listed in Section D have a Distribution System Type value in D07 =DuctsNone - Air distribution systems without ducts, then display the section does not apply message;  **else** require one row of data in this table for each space conditioning system in section E field E02 that meets the following two conditions: 1:[D04=Packaged Gas Furnace] 2:[D07≠ DuctsNone].  **Also** require one row in this table for each indoor unit in section E field E03 that meets the following two conditions: 1:[value in D04=central gas furnace], 2:[the value in E03 ≠ G03],  **Also** require one row in this table for each space conditioning system in section F field F02 that meets the following three conditions: 1:[value in D05=central packaged AC, or central large packaged AC], 2:[the same packaged unit is not already listed in section E thus E02≠F02]; 3:[value in D07≠DuctsNone],  **Also** require one row in this table for each space conditioning system in Section H field H02 that meets the following three conditions: 1:[value in D05=central packaged HP, or central large packaged HP], 2:[the same packaged unit is not already listed in section E thus E02≠H02]; 3:[value in D07≠ductsNone]  **Also** require one row of data in this table for each indoor unit in G03 for which the value in G05 = one of the following two values [\*Ducted>10ft length; \*Ducted ≤10ft length].>> | | | | | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 |
| SC System ID/Name from CF1R | SC System Description of Area Served | Indoor Unit Name or Description of Area Served | Supply Duct Location | Supply Duct  R-Value | Return Duct Location | Return Duct  R-Value | Exception from Min R-Value | Method of compliance with Airflow and Fan Efficacy Req's in 150.0(m)13 | Bypass Duct Status | Number of Air Filter Devices on Indoor Unit | Can Approved Airflow Protocols be used to test this System? | Can Approved Fan Efficacy Protocol be used to test this system? | Total Duct Length |
| <<auto filled D01>> | <<auto filled from D02>> | <<  **if** system type in D04=[Packaged Gas Furnace],  **then** value auto filled from D02,  **elseif** system type in [D04 or D05] = one of the following four types:  1: central packaged AC ;  2: central packaged HP  3: central large packaged AC ;  4: central large packaged HP  **then** value auto filled from D02,  else reference applicable values from E03 and G03 >> | <<**if** value in D07=  [Multiple split Indoor Units combined Ducted and Ductless]  **then** pick one value from list below,  **else** reference value from D07 as default. Allow user to overwrite only the following default values from D07:  **\*DuctsAttic**  **\*DuctsGarage**  **\*DuctsOutdoor;**  If overriding pick one from list:  \*conditioned space-entirely,  \*conditioned space -except 12ft,  \*unconditioned attic,  \*unconditioned crawl space,  \*controlled ventilation crawl space  \*unconditioned garage,  \*unconditioned basement,  \*outdoors  \*Ducts located in multiple places  \*Verified low-leakage ducts entirely in conditioned space  flag non-default values and report in project status notes field; a revised CF1R may be required >> | << calculted field:  if C10 =Verified Duct System Design,  then display text:  Verified  Duct  System  Design;  else user pick from list:  \*R-4.2,  \*R-6,  \*R-8,  \*R-10,  \*R-12;  and check value: must be ≥ value in C10 to comply subject to the following exceptions:  **if** D07= \*LowLlCod - Verified low-leakage ducts in conditioned space,  **then** R-4.2 complies;  **elseif** J08=  \*Ducts ≥R4.2 entirely in Conditioned Space,  **then** R-4.2 complies;  else flag non-compliant value and do not allow registration to proceed >> | <<if value in D07=  [Multiple split Indoor Units combined Ducted and Ductless]  then pick one value from list below,  else reference value from D07 as default. Allow user to overwrite only the following default values from D07:  **\*DuctsAttic**  **\*DuctsGarage**  **\*DuctsOutdoor;**  If overriding pick one from list:  \*conditioned space-entirely,  \*conditioned space -except 12ft,  \*unconditioned attic,  \*unconditioned crawl space,  \*controlled ventilation crawl space  \*unconditioned garage,  \*unconditioned basement,  \*outdoors  \*Ducts located in multiple places  Verified low-leakage ducts entirely in conditioned space  flag non-default values and report in project status notes field; a revised CF1R may be required >> | << calculted field:  if C10 =Verified Duct System Design,  then display text:  Verified  Duct  System  Design;  else user pick from list:  \*R-4.2,  \*R-6,  \*R-8,  \*R-10,  \*R-12;  and check: value must be ≥ value in C10 to comply, but subject to the following exceptions:  **if** D07=  \*LowLlCod - Verified low-leakage ducts in conditioned space,  **then** R-4.2 complies;  **elseif** J08=  \*Ducts ≥R4.2 entirely in Conditioned Space,  **then** R-4.2 complies;  else flag non-compliant value and do not allow registration to proceed >> | << Default Value=No Exceptions,  allow user to override the default and select **one or more** of the following two values:  \*uninsulated ducts in wall cavity  \*Uninsulated exposed ducts  in directly conditioned space  if values in both J04 and J06=  \*conditioned space-entirely,  then also allow user to select the following value:  \*Ducts ≥R4.2 entirely in conditioned space>> | << if System Type in D05=no cooling, then result = Exempt - No Cooling;  elseif D04 or D05=one of the following five system types:  \*evaporative - direct,  \*evaporative - indirect,  \*evaporative - indirectdirect,  \*VCHP-Ducted  \*VCHP-Ducted+Ductless  then text value = Exempt System Type;  elseif J12=no, then result = "Exempt - Approved Protocols N/A";  elseif CF1R-PRF indicates HERS Verification=required, **AND** one or more of the following seven **(7)** conditions is true:  **(1)**value in C09 < 0.58 and D04≠ one of the following two:  \*\*central gas furnace  \*\*Packaged gas furnace  **(2)**value in C09 < 0.62 and D05 = one of the following two:  \*\*small duct high velocity HP  \*\*small duct high velocity AC  **(3)**value in C09 < 0.45 and  D04 = one of the following two:  \*\*central gas furnace  \*\*Packaged gas furnace  **(4)**value in C08 **>** 350 and D05 ≠ one of the following two:  \*\*small duct high velocity HP  \*\*small duct high velocity AC  **(5)**value in C08 > 250 and D05 = one of the following two:  \*\*small duct high velocity HP  \*\*small duct high velocity AC  **(6)**D09=Zonally Controlled  **(7)**either of E04 or G06=yes (is CFI Vent Sys),  **then** result = HERS Verified Fan Efficacy and Airflow Rate;  **elseif** CF1R-PRF indicates HERS Verification=required,  then user select one from following two:  \*HERS Verified Fan Efficacy and Airflow Rate;  \*HERS verified Return Duct Design per Table 150.0-B, C;>> | <<calculated field: reference value from B09 as default;  else:  allow user to override the default and pick one from following two:  \*Has Bypass Duct,  \*None  flag non-default values and report in project status notes field; a revised CF1R may be required >> | <<user enter integer value>>  note: this value will determine number or rows per indoor unit in the next section>> | <<**if** system type in D04 or D05 is one of the following system types:  \*multisplit HP-ducted  \*multisplit HP-ducted+ductless  \*multisplit AC-ducted  \*multisplit AC-ducted+ductless  **then** value=no,  **elseif** system type in D04 or D05 is one of the following system types:  \*central split AC;  \*central split HP  \*central packaged AC ;  \*central packaged HP  \*central large packaged AC  \*central large packaged HP,  **then** value=Yes,  **else** user pick one of the following two values from list:  \*\*yes  \*\*no  **check**:  **if** value=no,  **then** report in project status notes field that exemption from mandatory HERS verification of system airflow has been claimed. Enforcement agency confirmation is recommended  **also** report in project status notes field that better than minimum SEER or EER cannot not be claimed for performance compliance credit if the system cannot comply with the required HERS verification;  a revised CF1R may be required>> | <<if D04 or D05 = one of the following two types:  1:[VCHP-Ducted]  2:[VCHP-Ducted+Ductless]  then text value=[Exempt System Type],  **elseif** system type in D04 or D05 is one of the following system types:  \*multisplit HP-ducted  \*multisplit HP-ducted+ductless  \*multisplit AC-ducted  \*multisplit AC-ducted+ductless  **then** value=no,  **elseif** system type in D04 or D05 is one of the following six system types:  \*central split AC;  \*central split HP  \*central packaged AC ;  \*central packaged HP  \*central large packaged AC  \*central large packaged HP,  **then** value=Yes,  else user pick one of the following two values from list:  \*\*yes  \*\*no  **check**:  **if** value=no,  then report in project status notes field that exemption from mandatory HERS verification of system fan efficacy has been claimed. Enforcement agency confirmation is recommended,  also report in project status notes field that better than minimum SEER or EER cannot be claimed for performance compliance credit if the system cannot comply with the required HERS verification;  a revised CF1R may be required>> | <<**if** there is an applicable value in [either E05 or G05]=  [Ducted>10ft length],  **then** value=[>10ft]  **elseif** there is an applicable value in [either E05 or G05]=  [Ducted ≤10ft length],  **then** value=[≤10ft]  **else** user pick one text value from the following 2:  \*[>10ft]  \*[≤10ft]>> |
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| **K. Installed Air Filter Device Information**  Mandatory requirements for air filter devices are specified in Section 150.0(m)12. The installer shall place a sticker in or near the filter grille displaying the filter grille/rack design airflow rate and the maximum allowed clean filter pressure drop at the design airflow rate. This will inform the occupant of the airflow vs pressure drop performance required for replacement air filters.  <<**if** all of the SC Systems listed in Section D have a Distribution System Type value in D07 =DuctsNone - Air distribution systems without ducts , then display the section does not apply message;  **elseif** there are no duct systems in section J for which J14=[>10ft]];  **then** display the section does not apply message;  **else** require one row of data (each) for the quantity of air filter devices in J11 for each of the duct systems in section J (J03) for which J14=[>10ft]>> | | | | | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 |
| SC System ID/Name from CF1R | SC System Description of Area Served | Indoor Unit Name or Description of Area Served | Air Filter Name or Description of Location | Air Filter Device Type | Design Airflow Rate  for Air Filter Device  (cfm) | Air Filter Nominal Depth  (inch) | Air Filter Nominal Length  (inch) | Air Filter Nominal Width  (inch) | Air Filter  Calculated Nominal Face Area  (inch2) | Air Filter Required  Minimum Face Area  (inch2) | Face Area Compliance | Design Allowable Pressure Drop for Air Filter Device  (inch W.C.) |
| <<auto filled from D01>> | <<auto filled from D02>> | <<auto filled from J03 | <<user input text, maximum 20 characters>> | <<user select from list:  \*Filter Grille  \*Furnace Mounted  \*Duct Mounted  >> | <<user enter numeric, xxxx>> | <<user enter integer value ≥1  >> | <<user enter integer value ≥1.00  >> | <<user enter integer value ≥1.00  >> | <<calculated value= K08\*K09  >> | <<**if** K07=1, **then** calculated value=(K06 ÷ 150) \* 144;  **elseif** system type value in either D04 or D05= one of the following two:  \*VCHP Indoor Units -Ducted, \*VCHP Indoor Units -Ducted+Ductless,  **then** value = (K06 ÷150) \* 144;  **else** display text: "specified by system designer">> | <<if value in K11= "specified by system designer",  then display text: "specified by system designer";  elseif K10≥K11,  then display text: "complies",  else display text:"does not comply">> | <<if system type value in either D04 or D05= one of the following two:  \*VCHP Indoor Units - Ducted, \*VCHP Indoor Units Ducted+Ductless,  then value = 0.1,  elseif value in K07=1,  then value = 0.1;  else user enter value, numeric, 1.5≥x.xx≥0.01  >> |
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| **L. Air Filter Device Requirements**  <<if section K does not apply, then display the section does not apply message; else display this section>> | |
| 01 | The system shall be designed to ensure that all recirculated air and all outdoor air supplied to the occupiable space is filtered before passing through the system's thermal conditioning components. |
| 02 | The system shall be designed to accommodate the clean-filter pressure drop imposed by the system air filter device(s). The design airflow rate and maximum allowable clean-filter pressure drop at the design airflow rate applicable to each air filter shall be determined by the system designer. The system installer shall affix a sticker/label to each system air filter grille/rack location that discloses the filter's design airflow rate and the filter's maximum allowable clean-filter pressure drop at the design airflow rate. The sticker/label shall be permanently affixed to the air filter device, readily legible, and visible to a person replacing the air filter. |
| 03 | All system air filter devices shall be located and installed in such a manner as to allow access and regular service by the system owner. |
| 04 | The system shall be provided with air filters having a designated efficiency equal to or greater than MERV 13 when tested in accordance with ASHRAE Standard 52.2, or a particle size efficiency rating equal to or greater than 50% in the 0.30-1.0 μm range and equal to or greater than 85 percent in the 1.0-3.0 μm range when tested in accordance with AHRI Standard 680. |
| 05 | The system shall be provided with air filters that have been labeled by the manufacturer to disclose efficiency and pressure drop ratings that conform to the efficiency and pressure drop requirements for the air filter grilles/racks. |
| **The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.** | |

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| **M. HERS Verification Requirements for Duct Systems**  <<if all of the SC Systems listed in Section D have a Distribution System Type value in D07 =DuctsNone - Air distribution systems without ducts , then display the section does not apply message; **else** require one row of data in this table for each of the indoor units listed in J03>> | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 |
|  |  |  | MCH-20 | MCH-21 | MCH-22 | MCH-23 | MCH-28 | MCH-29 | MCH-30 |
| SC System ID/Name from CF1R | SC System Description of Area Served | Indoor Unit Name or Description of Area Served | Duct Leakage Test | Duct Location Verification | AHU Fan Efficacy (W/cfm) | AHU Airflow Rate  (cfm/ton) | Return Duct Design - Table 150.0-B or C | Supply Duct Surface Area R-Value Buried Ducts | Central Fan Ventilation Cooling Credit |
| <<auto filled from D01>> | <<auto filled from D02>> | <<autofilled, reference value from J03>> | <<**if** the CF1R flags the requirement for HERS verification of duct leakage for the system ID/Name in M01,  **then** display result=yes>> | <<**if** the value in J08=  \*Ducts ≥R4.2 entirely in conditioned space  **and** the values in either J05 or J07 are <C10  **then** display result in this field=yes;  **elseif** J08= one of the following two:  \*uninsulated ducts in wall cavity  \*Uninsulated exposed ducts  in directly conditioned space,  **then** result=yes  **Elseif** value in B06= one of the following:  \*DuctsInEx12; \*DuctsInAll;  **then** display result in this field=yes;  else display result=no>> | <<**if** J13=no,  **then** result= no  **elseif** J09 result is Fan Efficacy and Airflow Rate,  **then** result is yes,  **elseif** either E04 or G06 = yes (CFI IAQ ventilation),  **then** result= yes;  else result=no>> | <<**if** D04 or D05 = one of the following two system types:  \*VCHP-Ducted  \*VCHP-Ducted+Ductless  **then** result=yes  **elseif** J09 result is Fan Efficacy,  and Airflow Rate  **then** result = yes,  **elseif** N03=yes,  **then**  **if** value in M08=no,  **then** value in this  field=yes  **elseif** either E04 or G06 = yes (CFI IAQ ventilation), then result= yes;  else result=no>> | <<**if** J09 result is Return Duct Design per Table 150.0-B, C;  **then** result=yes  **else** result=no>> | <<**if** the CF1R flags the requirement for HERS verified duct design (Supply Duct Surface Area, R-Value, or Buried Ducts),  **then** result=yes,  **else** result=no>> | <<calculated field:  **if** B05 = one of the following two values:  \*variable flow  \*fixed flow  **then** result=yes,  **elseif** B05=N/A,  **then** result=no>> |
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| **N. HERS Verification Requirements for Space Conditioning Equipment**  <<require one row of data in this table for each of the SC Systems listed in F01 and H01>> | | | | |
| 01 | 02 | 03 | 04 | 05 |
|  |  | MCH-25 | MCH-26 | MCH-33 |
| SC System ID or Name from CF1R | SC System Description of Area Served | Refrigerant Charge | Rated  SC System  Equipment Verification | VCHP Compliance Credit |
| <<auto filled from D01>> | <<auto filled from D02>> | <<calculated field:  if the CF1R flags the requirement for HERS verification of Refrigerant Charge; then result=yes,  elseif B04 ≠ D05, and A02 = one of the following values:  2, 8, 9, 10, 11, 12, 13, 14, 15, then result = yes;  else result=no>> | <<**if** B03 or B04=one of the following three system types:  \*ductless mini-split AC  \*ductless mini-split HP  \*ductless VRF AC;  \*ductless VRF HP;  \*ductless multi-split AC  \*ductless multi-split HP  \*ducted mini-split AC  \*ducted mini-split HP  **then** result=no  **elseif** B04={Small Duct High Velocity AC system},  **and** C06 > 12,  **then** result=yes.  **elseif** C06 > 14,  **then** result=yes;  **elseif** N01 is one of the HP systems listed in H01,  **then** result = yes;  **elseif** the following three conditions are true:  1:[B04 = {central packaged AC}],  2:[C07 ≠N/A],  3:[C07 > 11.0], [  **then** result = yes.  **elseif** B04 = {central split AC} and **both** of the following two criteria are true:  1: [C07 > 11.7];  2: [F10 ≥ 45000];  **then** result=yes;  **elseif** B04 = [central split AC] and **both** of the following two criteria are true:  1: [C07 > 12.2];  2: [F10 < 45000];  **then** result=yes;  else result=no>> | <<**if** D04 or D05=one of the following three system types:  \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP -Ducted+Ductless  **then** result in this field=yes,  **else** result in this field=no>> |
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| **O. Space Conditioning Systems, Ducts and Fans – Mandatory Requirements and Additional Measures**  Additional mandatory requirements from Section 150.0 that are not listed here may be applicable to some systems. These requirements may be applicable to only newly installed equipment or portions of the system that are altered. Existing equipment may be exempt from these requirements. | |
| **Heating Equipment** | |
| 01 | Equipment Efficiency: All heating equipment must meet the minimum efficiency requirements of Section 110.1 and Section 110.2(a) and the Appliance Efficiency Regulations. |
| 02 | Controls: All unitary heating systems, including heat pumps, must be controlled by a setback thermostat. These thermostats must be capable of allowing the occupant to program the temperature set points for at least four different periods in 24 hours. See Sections 150.0(i), 110.2(b). |
| 03 | Sizing: Heating load calculations must be done on portions of the building served by new heating systems to prevent inadvertent undersizing or oversizing. See sections 150.0(h)1 and 2). |
| 04 | Furnace Temperature Rise: Central forced-air heating furnace installations must be configured to operate at or below the furnace manufacturer's maximum inlet-to-outlet temperature rise specification. See Section 150.0(h)4. |
| 05 | Standby Losses and Pilot Lights: Fan-type central furnaces may not have a continuously burning pilot light. Section 110.5 and Section 110.2(d). |
| **Cooling Equipment** | |
| 06 | Equipment Efficiency: All cooling equipment must meet the minimum efficiency requirements of Section 110.1 and Section 110.2(a) and the Appliance Efficiency Regulations. |
| 07 | Refrigerant Line Insulation: All refrigerant line insulation in split system air conditioners and heat pumps must meet the R-value and protection requirements of Section 150.0(j)2 and 3, and Section 150.0(m)9. |
| 08 | Condensing Unit Location: Condensing units shall not be placed within 5 feet of a dryer vent outlet. See Section 150.0(h)3A. |
| 09 | Liquid Line Filter Drier: A liquid line filter drier shall be installed according to the manufacturer’s specifications 150.0(h)3B. |
| 10 | Sizing: Cooling load calculations must be done on portions of the building served by new cooling systems to prevent inadvertent undersizing or oversizing. See Section 150.0(h)1 and 2. |
| **Air Distribution System Ducts, Plenums and Fans** | |
| 11 | Insulation: The minimum duct insulation value is R-6. Note that higher values may be required by the prescriptive or performance requirements. See Section 150.0(m)1. |
| 12 | Connections and Closures: All installed air-distribution system ducts and plenums must meet the requirements of CMC Sections 601.0, 602.0, 603.0, 604.0, 605.0 and ANSI/SMACNA-006-2006: Supply-air and return-air ducts and plenums must be insulated to a minimum installed level of R-6.0, otherwise a minimum of R-4.2 is allowed if the system is enclosed entirely in conditioned space as confirmed through field verification and diagnostic testing in accordance with the requirements of Reference Residential Appendix RA3.1.4.3.8. Exceptions for ducts in interior wall cavities or exposed ducts entirely in conditioned space are specified in Section 150.0(m)1B. |
| **Heat Pump Thermostat** | |
| 13 | A thermostat shall be installed that meets the requirements of Section 110.2(b) and Section 110.2(c). |
| 14 | The thermostat shall be installed in accordance with the manufacturers published installation specifications. |
| 15 | First stage of heating shall be assigned to heat pump heating. |
| 16 | Second stage back up heating shall be set to come on only when the indoor set temperature cannot be met. |
| **The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.** | |