VMC GROUP
THE POWER OF TOGETHER™

TRANE®

# CERTIFICATE OF COMPLIANCE
## SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

Certification No.

## VMA-45074-01C (Revision 11)

Expiration Date: 12/31/2026

### Certification Parameters:

The nonstructural products (mechanical and/or electrical components) listed on this certificate are CERTIFIED[1] FOR SEISMIC APPLICATIONS in accordance with the following building code[2] releases.

**IBC 2018, 2015, 2012, 2009**

The following model designations, options, and accessories are included in this certification. Reference report number VMA-45074-01 as issued by The VMC Group for a complete list of certified models, included accessories/options, and certified installation methods.

**Trane**; Water Cooled Chillers
**CenTraVac (CTV)**; 190 - 3550 Tons

The above referenced equipment is **APPROVED** for seismic application when properly installed[3], used as intended, and contains a Seismic Certification Label referencing this Certificate of Compliance[4]. As limited by the tabulated values, below grade, grade, and roof-level installations, installations in essential facilities, for life safety applications, and/or of equipment containing hazardous contents are permitted and included in this certification with an Equipment Importance Factor assigned as $I_p$=1.5. The equipment is qualified by detailed structural and comparative analaysis, as well as successful seismic shake table testing at the nationally recognized University of California Berkeley Pacific Earthquake Engineering Research Center and University of California at San Diego Laboratory under the witness of the ISO Accredited Product Certification Agency, the VMC Group.

| Certified Seismic Design Levels | | | |
|---|---|---|---|
| Certified **IBC** | **Importance $I_p \leq 1.5$**<br>Soil Classes A-E<br>Risk Categories I-IV<br>Design Categories A-F | z/h ≤ 1.0 | z/h = 0.0 |
| | | $S_{DS} \leq 0.750$ g | $S_{DS} \leq 1.200$ g |

| Certified Seismic Installation Methods | |
|---|---|
| Rigid Mounting From Unit Base To Rigid Structure | External Isolation Mounting From Unit Base To Rigid Structure |


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### Certified Product Table:

| Model | Compressor Size Range | Frequency [ Hz ] | Max. Length [ in ] | Max. Width [ in ] | Max. Height [ in ] | Max. Weight [ lbs ] | Certifications |
|---|---|---|---|---|---|---|---|
| CVHE | 190 - 420 | 50 | 180.25 | 95.44 | 114.38 | 28,237 | Seismic Design, Standard Design |
| | 230 - 500 | 60 | | | | 31,840 | |
| CVHG | 480 - 1100 | 50 | | 126.44 | 135.25 | 58,886 | |
| CVHL | 380 - 1800 | 60 | 202.75 | 138.88 | 141.13 | 68,597 | |
| CVHF | 350 - 1720 | | | | | 69,475 | |
| CDHG | 1250 - 2250 (670x2) - (1100x2) | 50 | 256.00 | | | 86,879 | |
| CDHL | 1600 - 3550 (820x2) - (1800x2) | 60 | 360.00 | | | 107,775 | |
| CDHF | 1500 - 3500 (770x2) - (1720x2) | | | | | 109,499 | |

| Group | Type | $S_{DS}$ (z/h=0) | $S_{DS}$ (z/h=1) | $A_{Flex-H}$ | $A_{Rig-H}$ | $A_{Flex-V}$ | $A_{Rig-V}$ | $F_p/W_p$ |
|---|---|---|---|---|---|---|---|---|
| Seismic | AC156 | 1.85 | 1.16 | 1.85 | 1.39 | 0.77 | 0.31 | 0.74 |
| Standard | | 1.2 | 0.75 | N/A | N/A | N/A | N/A | 0.48 |

Notes:
1) Refer to certification report for full product line listings, certified shell sizes and lengths, and certified subcomponents.
2) Seismic Design includes extended baseplate used for shake testing. Refer to certification report for details and limitations on the sesimic design and extended baseplates.
3) Standard Design does not include extended baseplates, but requires 12 mounting locations per chiller foot. Refer to certification report for details and limitations on the standard design.
4) Seismic Design for Duplex Units (CDHG, CDHL, CDHF models) are only certified up to IBC 2009. IBC 2012-2018 Certification excluded for Duplex Seismic Design Units.

This certification only includes the chillers as detailed in the above charts. The chiller configuration and options must be a catalogue design and factory supplied. The chiller must be installed and attached to the building structure per the manufacturer's supplied seismic installation instructions. This certification excludes separable shell configurations, heat recovery condensers, all non-factory supplied accessories, all connections for electrical, fuel, heating or cooling fluid, or other pipe/conduit connections and all non-catalogued, standard options and/or configurations not detailed in the above charts. Flexibility in the connections must be maintained as to not transmit load into the equipment. Design specials are outside the scope of this certification.

IBC CERTIFIED
VMC GROUP

**VMA-45074-01C (Revision 11)**
Issue Date: Wednesday, September 30, 2009
Revision Date: Wednesday, October 9, 2024
**Expiration Date: Thursday, December 31, 2026**

# CERTIFICATE OF COMPLIANCE

## SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS AND SYSTEMS

### Notes & Comments:

1. All equipment listed herein successfully passed the seismic acceptance criteria for shake testing non-structural components and systems as set forth in the ICC AC-156. The Test Response Spectrum (TRS) enveloped the Required Response Spectrum (RRS) for all units tested. The tested units were representative sample(s) of a contingent of models and all remained captive and structurally sound after the seismic shake simulation. The units also remained functionally operational after the simulation testing as functional testing was completed by the equipment manufacturer before and after the seismic simulations. Although a seismic qualified unit inherently contains some wind resisting capacity, that capacity is undetermined and is excluded from this certification. Snow/Ice loads have been neglected and thus limit the unit to be installed both indoors (covered by an independent protective structure) and out of doors (exposed to accumulating snow/ice) for ground snow loads no greater than 30 psf for all applications.

2. The following building codes are addressed under this certification:
   IBC 2018 referencing ASCE7-16 and ICC-ES AC-156
   IBC 2015 referencing ASCE7-10 and ICC-ES AC-156
   IBC 2012 referencing ASCE7-10 and ICC-ES AC-156
   IBC 2009 referencing ASCE7-05 and ICC-ES AC-156

3. Refer to the manufacturer supplied installation drawings for anchor requirements and mounting considerations for seismic applications. Required anchor locations, size, style, and load capacities (tension and shear) may be specified on the installation drawings or specified by a 3rd party. Mounting requirement details such as anchor brand, type, embedment depth, edge spacing, anchor-to-anchor spacing, concrete strength, special inspection, wall design, and attachment to non-building structures must be outlined and approved by the Engineer of Record for the project or building. Structural walls, structural floors, and housekeeping pads must also be seismically designed and approved by the project or building Structural Engineer of Record to withstand the seismic anchor loads as defined on the installation drawings. The installing contractor is responsible for ensuring the proper installation of all anchors and mounting hardware.

4. For this certificate and certification to remain valid, this certificate must correspond to the "Seismic Certification Label" found affixed to the unit by the factory. The label ensures the manufacturer built the unit in conformance to the IBC seismic design criteria set forth by the Certified Seismic Qualification Agency, the VMC Group, and meets the seismic design levels claimed by this certificate.

5. Mechanical, Electrical, and Plumbing connections to the equipment must be flexibly attached as to not transfer load through the connection. The structural integrity of any conduit, cable trays, piping, ductwork and/or flexible connections is the responsibility of others. This certification makes no statements of compliance in regards to NEMA, IP, UL, CSA, or other relevant standards after a seismic event. For compliance to other relevant standards, please contact the manufacturer.

6. This certificate applies to units manufactured at:
   2600 Losey Blvd, La Crosse, WI 54601

7. This certification follows the VMC Group's ISO-17065 Scheme.

John P. Giuliano, PE
President, VMC Group

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