

Seismic force calculation

(as per NZS 4219:2009)



Product: Rinnai **INFINITY VT** gas continuous flow water heaters

Earthquake load demand as per section 3.4

EQ load demand	F	23.409
F=C x W (equation 3.1) Appliance weight ¹	W	17.00
Building placement factor ²	CH	1
Zone factor ³	Z	0.6
Performance factor	CP	0.85
Risk factor ⁴	Rc	1
Lateral force coefficient 2.7 x CH x Z x CP x Rc (equation 3)	C	1.377

¹ Assumes 17 kg max for VT26, other VT models weigh less
² Assumes appliance is located at ground floor level
³ Assumes worst case zone factor based on table NZS 4219 Table 3
⁴ Assumes building importance of 4 and component value of P5 based on NZS 4219:2009 Table 2 and Table 1 calculated as per NZS 4219:2009 3.4.3 Table 5

Relative seismic displacement as per section 3.5

Height between fixing points ¹	Hz	0.571
Component displacement 0.025 x Rc x Hz (equation 3.3)	D	0.001428

¹ Assumes 571 mm on a VT unit between top and bottom bracket hole centroids

Combined action on component

kg - 273.9906
kn - 2.685108 (safety factor 1.936607)

Rinnai VT CFWH mounting brackets and hardware has been tested for shear force by SGS in test reports INZ 61025-01 and 61025-02

- Shear force of mounting bracket 5.2 kN
- Shear force of M5 screw 10.0 kN

Fixing suggestions

- Timber fixing: as per NZS 4219:2009 Table 9, 8 mm diameter coach screw inserted into grain side dry radiata pine timber
- Steel fixing: as per NZS 4219:2009 Table 10, M8 bolt
- Masonry drill in fixing: 8 mm (M6) Ramset dynabolt as per Ramset Technical Resource 31.1

Please note: The calculation only pertains to the appliance and not the associated pipework.

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