

## Incident Summary #II-1980963-2025 (#58912) (FINAL)

SUPPORTING INFORMATION	Incident Date	October 18, 2025	
	Location	Whistler	
	Regulated industry sector	Gas - Natural gas system	
	Impact	Qty injuries	2
		Injury description	Two occupants of a rental suite went to a medical clinic to seek medical attention for alleged carbon monoxide (CO) poisoning.  The licensed gasfitter while testing the flue gases of the fireplace termination became lightheaded after 10 seconds from exposure outdoors to levels of CO exceeding 9,000 parts per million (ppm). Please note that after conducting remote flue gas analysis, readings of CO reached levels exceeding 13,000 ppm.
		Injury rating	Moderate
	Damage	Damage description	N/A
		Damage rating	None
	Incident rating	Moderate	
	Incident overview	A free-standing direct vent gas fireplace in a rental property was installed incorrectly and allowed the products of combustion to be recirculated back into the fireplace which created dangerous levels of CO which were able to enter the living space with occupants inside.	
INVESTIGATION CONCLUSIONS	Site, system and components	<p>The property was privately owned but operated by a vacation property management company for holiday rentals. At the time of the incident the property was occupied by renters.</p> <p>The free-standing direct vent gas fireplace uses a sealed venting system made up of two pipes: a larger pipe which draws air in and a smaller inner pipe that expels flue gasses from the appliance. Both air intake (combustion air from outside) and exhaust (flue gasses) pass through a single combined termination fitting, which contains two fully separated pathways. The design ensures the appliance receives clean, oxygen-rich air while safely venting combustion by-products.</p> <p>If the termination is installed too close to walls, corners, grade level, obstructions, or areas where wind turbulence occurs, the exhausted flue gasses can be redirected back toward the intake. This recirculation allows carbon-dioxide-rich flue gas to enter the burner's combustion air supply, reducing oxygen levels and causing incomplete combustion. When the flame is deprived of adequate oxygen, the appliance can produce elevated levels of CO, increasing both safety risks and the potential for equipment malfunction.</p> <p>Typically, gas appliances installed above the altitude of 2,000 ft are required to be derated (when the gas air ratio is adjusted to compensate for the thinner air at higher altitude) as per the manufacturer's installation instructions. Derating is typically done by installing smaller gas orifices that reduce the amount of gas delivered to the burners. Some appliances like fireplaces may also require adjustment of air shutters to achieve proper air fuel mixtures and flame visuals. Derating is a critical adjustment</p>	

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	<p>to ensure a gas appliance operates safely and as specified by the manufacturer and the certification agency.</p> <p>Natural gas requires a minimum amount of oxygen to burn completely. When the minimum amount of air is not present, the result is incomplete combustion. One of the by-products of incomplete combustion is CO. CO is a colourless, odourless, tasteless gas that is toxic to humans and animals. Exposure to CO interferes with the body's ability to absorb oxygen, which can result in serious illness or death. (For more information on CO check out "<a href="#">CO Safety Tips</a> ").</p> <p>The fireplace has a round burner (a cylinder with strategically placed holes allowing gas to ignite safely and decoratively) encompassing the decorative logs, it is critical that the burner flames completely encompass the burner, so no unburnt gas is introduced into the fireplace.</p>
<p>Failure scenario(s)</p>	<p>In 2024, the rental unit received a renovation that included the installation of a new gas fireplace. In November 2024, the fireplace and venting were installed by a licenced gasfitter working for a gas contracting company.</p> <p>When the fireplace was installed by the contractor the vent termination was installed in a non-compliant location under a sloped roof on the patio. The termination was approximately 12 inches under a pitched roof that was six feet wide and the lower edge of the roof was approximately three feet below the flue termination. Openings into the property's outer wall under the sloped roof were approximately 12 inches above of the flue (<a href="#">Image 3</a>). The gasfitter who installed the fireplace did not know the venting installation was non-compliant and did not anticipate any issues or hazards with its configuration.</p> <p>The altitude at the location was approximately 2300 ft above sea level. The manufacturer requires the installation of a high-altitude adjustment kit when the appliance is operated on natural gas and is installed above 2000 ft. The conversion requires the installation of a smaller gas orifice and requires adjustments to gas pressure and air for proper operation. The kit also provides a decal which is required to be filled out and installed on the appliance identifying that it has been derated. The contractor who completed the installation, did not install a high-altitude adjustment kit in the fireplace. The result was a gas air mixture that was too gas rich, making ignition more difficult and inconsistent. This was evidenced by only approximately 60 percent of the burner igniting, which allowed unburnt gas to enter the fireplace, leading to incomplete combustion and the production of elevated levels of CO.</p> <p>When the fireplace operated, the flue gasses containing elevated levels of CO were expelled through the vent termination. The location under the sloped roof did not allow for the gasses to safely dissipate outdoors. The warm flue gasses collected up under the sloped roof and were drawn back into the fireplace's combustion chamber through the air intake piping. This further reduced the amount of available oxygen at the gas burner creating very high levels of CO (13,000 ppm) that vented outdoors and migrated through openings into the indoor space that exposed the occupants to toxic CO. A CO alarm in the residence alerted the occupants who called emergency services. The occupants sought medical attention for treatment to CO exposure.</p>

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### Facts and evidence

#### Statements

##### **Licensed Gas Contractor who attended site after the incident**

- Operated the fireplace and observed that the burner only ignited approximately 60 percent of the burner.
- Conducted flue gas analysis and initially registered 9,000 ppm of CO in the flue gas.
- They stopped the sampling after approximately 10 seconds when they became lightheaded.
- Setup the flue gas analysis so nobody needed to be in the area then registered a CO concentration of 13,000 ppm in the flue gases
- Tested inside the openings above the flue termination which also registered CO within the opening.
- Also confirmed the only regulated gas appliance within the property was the fireplace, and a portable BBQ was on the deck.

##### **Licensed Gas Contractor who installed the fireplace**

- Confirmed that they did install the fireplace and confirmed they were the Licensed Gas Fitter who conducted the fireplace installation.
- They did not know the venting installation was non-compliant and did not anticipate any issues or hazards with its configuration.

##### **Vacation property management company**

- The CO detector was activated during the incident.
- The renters who rented the suite sought medical attention for suspected CO poisoning.

#### Documents

##### **The fireplace manufactures installation instructions**

- The appliance may be adjusted for altitude over 2000 ft for natural gas.
- If the installer must convert the unit to adjust for varying altitudes, the information sticker must be filled out and applied to the appliance at the time of the conversion.
- Clearly state where the flue termination shall be located with clear instructions regarding locations UNDER a veranda or porch.
- Clearly state the maximum altitude of 2,000 ft before the fireplace must be derated and state how to derate the fireplace and what parts can be used.
- The manufactures installation instructions go as far as explaining how to commission the fireplace for safe operation.

##### **Code, Act, and Regulations**

- Before leaving installations, installers shall ensure that the appliance, accessory, component, equipment, or piping and tubing they installed complies with the code requirements and the person initially activating the appliance shall ensure that the appliance is in a safe working order.
- A direct vent fireplace vent shall not be installed less than 24 inches below a ceiling or soffit that has perforations (openings).
- When an appliance is installed at elevations above the maximum elevation option provided by the manufacturer, the input rate shall be reduced following the manufacturer's certified instructions.
- A vent or chimney shall provide effective venting and shall be designed and constructed to remove all flue gases to the outdoors.

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	<ul style="list-style-type: none"> <li>• A vent shall not terminate underneath a veranda, porch, or deck unless the veranda, porch, or deck is fully open on a minimum of two sides beneath the floor; and the distance between the top of the vent termination and the underside of the veranda, porch, or deck is greater than one foot (300 mm).</li> </ul> <p><b>Site observations</b></p> <ul style="list-style-type: none"> <li>• Online resources show the location of the installation was at approximately 2300 feet above sea level.</li> <li>• The gas fireplace had not been derated for high altitude.</li> </ul>
<p>Causes and contributing factors</p>	<p>The incident was caused by the incorrect installation of the fireplace vent termination which allowed the flue gasses to recirculate into the fireplace combustion chamber creating high levels of CO which migrated to the indoor space.</p> <p><b>Contributing factors to the incident include</b></p> <ul style="list-style-type: none"> <li>• The fireplace not being correctly derated for the high altitude contributed to the incomplete combustion and production of CO.</li> <li>• The qualified installer not being aware that the installation was non-compliant and did not anticipate any issues or hazards with its configuration.</li> </ul>



Image 1 – Outside patio of rental suite.



Image 2 – Closeup showing the sloped overhang of the covered patio.



Image 3 – Gas fireplace direct vent termination under the sloped roof.



Image 4 – Freestanding direct vent gas fireplace.

**JØTUL** MODEL / MODÈLE: JØTUL GF 370 DV II

Vented Gas Fireplace Heater  
Not for use with solid fuels.

Foyer au gaz à évacuation  
Ne pas utiliser avec du combustible solide.

Serial No. / No. De Série:  
**47007622**

Refer to the Intertek Directory of Building Products (<https://bpdirectory.intertek.com>) for detailed information.

Reportez-vous au répertoire des produits de construction d'Intertek (<https://bpdirectory.intertek.com>) pour obtenir des informations détaillées.

Manufactured by:  
Jøtul North America, Inc.  
Gorham, Maine U.S.A.



Certified to / Certifié:  
ANSI Z21.88-2016  
CSA 2.33-2016  
CAN/CGA 2.17-M17

Intertek  
W/N 14878



Canadian energy performance verified.  
Rendement énergétique vérifié.

Conforms to / Conformé:  
CAN/CSA P4.1-15  
Natural / Gaz Naturel - 71.14%  
Propane / Gaz Propane - 64.13%

Intertek  
EP5010378

IF FUEL CONVERTED, PLACE IDENTIFICATION LABEL **B** HERE.  
PLACEZ L'ÉTIQUETTE DE CONVERSION DE CARBURANT **B** ICI.

223234-

SPECIFICATIONS	NG	LP	CARACTÉRISTIQUES
Min. Input Rate: (Btu / hr)	18,170	20,750	Débit Calorifique minimum selon
Max. Input Rate: 0 - 2000 ft. (Btu / hr)	28,000	24000	Débit Calorifique maximum selon
Max. Input Rate: 2000 - 4500 ft. (Btu / hr)	28,000	24,000	Débit Calorifique maximum selon
Manifold Pressure - Low: (in.wc / kPa)	1.6 / .398	6.4 / 1.59	Pression a la d'échappement élevée
Manifold Pressure - High: (in.wc / kPa)	3.5 / .870	10.0 / 2.48	Pression a la d'échappement basse
Min. Supply Pressure: (in.wc / kPa)	5.0 / 1.24	12.0 / 2.99	Pression d'alimentation minimum
Orifice Size: 0 - 2000 ft. (FACTORY EQUIPPED)	#38	#53	Garnitures des injector: 0 - 610 m
Orifice Size: 2000 - 4500 ft.	#39	#53	Garnitures des injector: 610 - 1372 m

**CLEARANCE TO COMBUSTIBLES / DEGAGEMENT MINIMUM DE MATERIAUX COMBUSTIBLES**

/ Côte: 7 in. / 178 mm / Coin: 5 in. / 127 mm Arrière-garde: 3 in. / 76 mm / Profondeur à fourneau: 16 3/4 in. / 412 mm	SEE INSTRUCTION MANUAL FOR DETAILED INFORMATION. MAXIMUM VENT RUN: HORIZONTAL 20 ft. / 6.09 m VERTICAL 35 ft. / 10.66 m
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Image 5 – Data tag for gas fireplace.

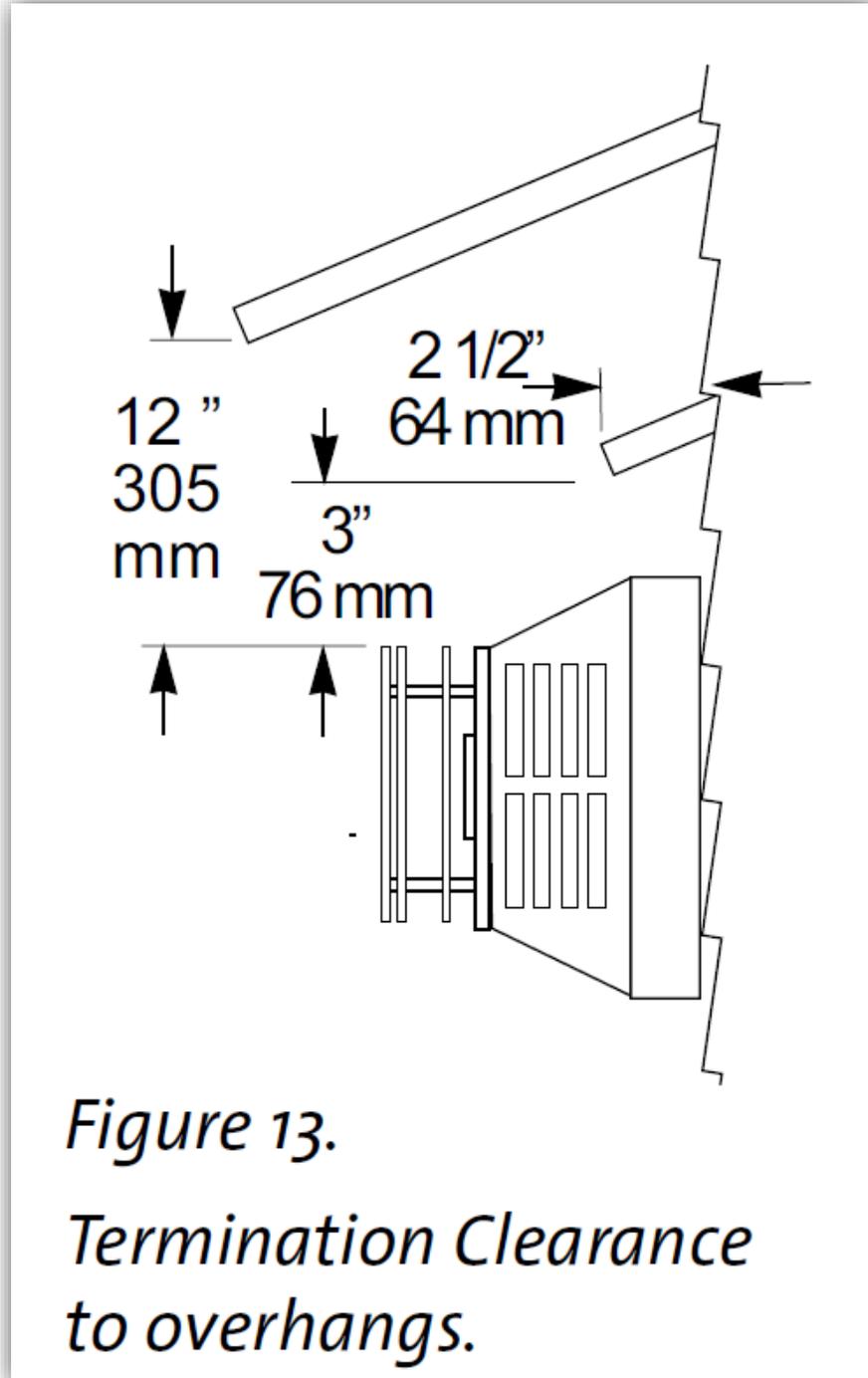


Image 6 – Illustration from the manufacturer’s installation instructions that detail that a horizontal termination cap must maintain a 3” clearance to any overhead combustible projections that are 2 1/2” or less. It must also maintain a 12” clearance from projections that exceed 2 1/2”.