

# 25VS Vapor Sensor



## Vapor Sensor

The 25VS flammable vapor sensor is a silicone-based sensor that detects vapors released during a typical gasoline spill. The 25VS requires no power to operate and offers long life and good sensitivity to most gasoline components within a wide temperature operating range.

Therm-O-Disc's 25VS was custom designed for the Water Heater Industry Joint Research and Development Consortium to meet Flammable Vapor Ignition Resistance (FVIR) requirements of ANSI Z21.94/CSA 6.31 standard.



## Principle of Operation

The 25VS sensor is comprised of three primary components: a sensor film, an insert-molded base, and a molded cover. The sensor film (a proprietary mixture of silicone and carbon) is deposited on the insert-molded base and shielded from the environment with a thermoplastic cover ultrasonically welded to the base.

The custom designed silicone system provides a robust foundation and support structure for the carbon. The carbon, which acts as a conductor, is dispersed throughout the silicone such that, in the absence of gasoline vapor, the carbon particles are in solid electrical contact. When the silicone encounters gasoline vapor, it expands, pulling some of the carbon particles apart, increasing the resistance of the sensor. The magnitude of resistance increase is dependent upon the gasoline vapor concentration; higher concentrations cause increased expansion of the silicone film, which result in a higher sensor resistance and vice versa.

## Unique Benefits

The Therm-O-Disc 25VS flammable vapor sensor yields several unique benefits when compared with other vapor sensing technologies. Unlike active sensors that typically utilize metal-oxide or infrared technologies, the 25VS does not require an external power source to detect flammable vapors, only the amount of power used by the customer’s control circuit to read the sensor’s resistance. This feature provides design flexibility and contributes to the efficient operation of the water heater control circuit to which it is connected.

## “One Shot” Use

Generally, the sensor will reset after a limited exposure to flammable vapor. However, Therm-O-Disc cannot validate the sensor’s response to flammable vapors after an initial flammable vapor exposure in the field. Therefore, the sensor must be replaced after an exposure to flammable vapor.

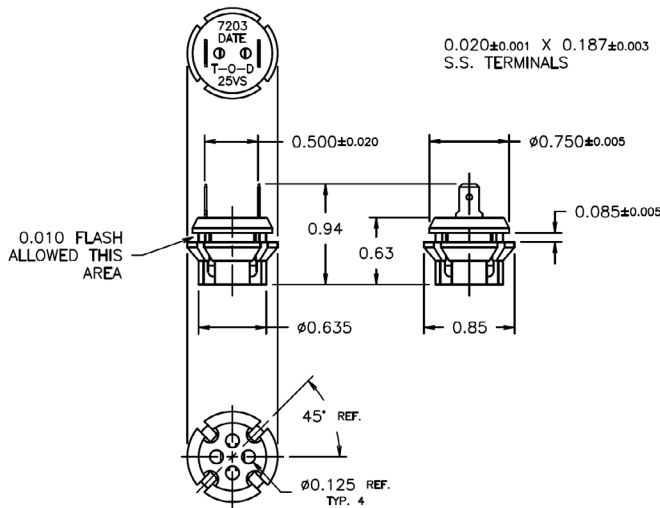


Figure 1  
Dimensions are shown in inches and (millimeters).

## Agency Ratings

Base Resistance @25 °C	Standard	Detected Gas(s)	Trip Point	Operating Temperature Range	Storage Temperature	Voltage	Humidity
7 to 25 K Ω	ANSI Z21.94/CSA 6,31	Gasoline vapor	50 k Ω	0 °C to 65°F (32°F to 150°F)	-40°C to 80°C (-40°F to 176°F)	5VDC	10% to 90% RH

## Important Notice

Users must determine the suitability of the control for their application, including the level of reliability required, and are solely responsible for the function of the end-use product.

These controls contain exposed electrical components and are not intended to withstand exposure to water or other environmental contaminants which can compromise insulating components. Such exposure may result in insulation breakdown and accompanying localized electrical heating.

A control may remain permanently closed or open as a result of exposure to excessive mechanical, electrical, thermal or environmental conditions or at normal end-of-life. If failure of the control to operate could result in personal injury or property damage, the user should incorporate supplemental system control features to achieve the desired level of reliability and safety. For example, backup controls have been incorporated in a number of applications for this reason.



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### Important Notice

The scope of the technical and application information included in this article is necessarily limited. Operating environments and conditions can materially affect the operating results of Therm-O-Disc™ products.

Users must determine the suitability of any Therm-O-Disc component for their specific application, including the level of reliability required, and are solely responsible for the function of the end-use product. It is important to review the Application Notes which can be found at [Emerson.com/thermodisc](https://www.emerson.com/thermodisc)