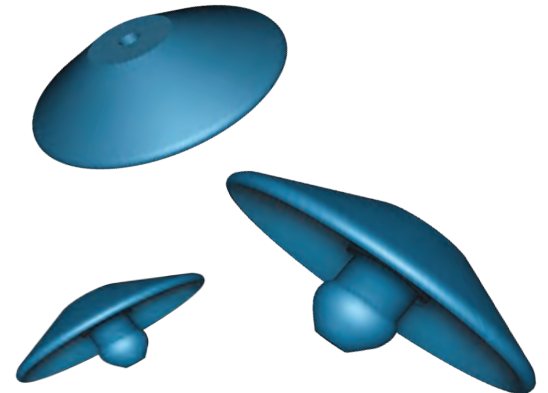


The Vernay VoltaValve® umbrella is an innovative flow control solution tailored specifically for managing thermal runaway situations. This specialized valve is designed with a unique resealing capability, which is crucial in preventing and mitigating the risks associated with thermal events in battery applications.

Thermal runaway is a critical safety concern in battery systems, where an increase in temperature can lead to a rapid and uncontrolled rise, potentially causing damage or failure. The Vernay VoltaValve® umbrella addresses this issue by providing a reliable mechanism to control and dissipate heat, ensuring the stability and safety of the battery system.

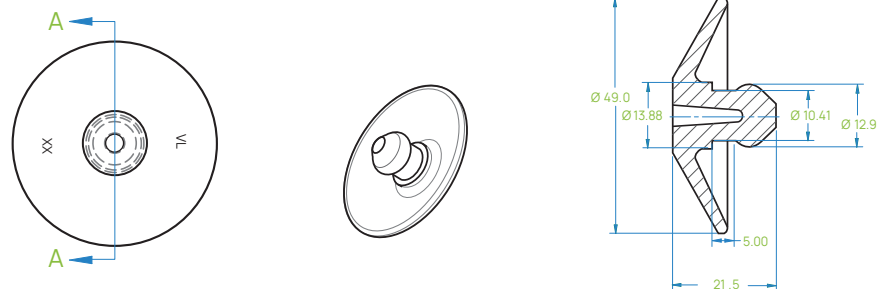


Working Principle

The Vernay VoltaValve® operates on the principles of an umbrella valve, leveraging its unique design and elastomeric properties to achieve precise flow control and thermal management. The flow control can be adjusted by altering the design of the counterpart; called the seat. When combined, the umbrella and seat result in specific opening and flow characteristics. The umbrella valve is also known for its normally closed feature. This means that at a low pressure differential, there will be no reverse leakage.

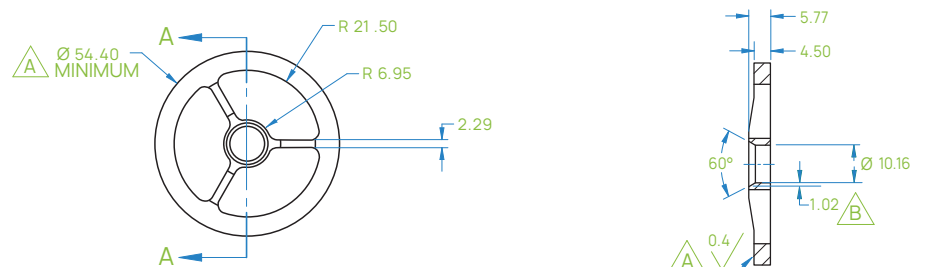
Design

This 49MM umbrella valve has been specifically designed for battery applications.



Mounting Instructions

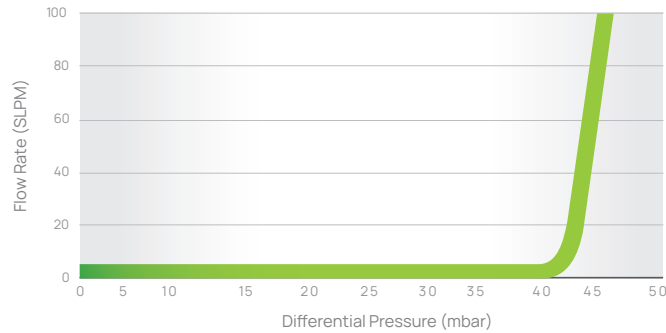
Umbrella valves can be mounted in any orientation. Below you will find the standard seat design, which is the basis for the standard opening and flow characteristics.



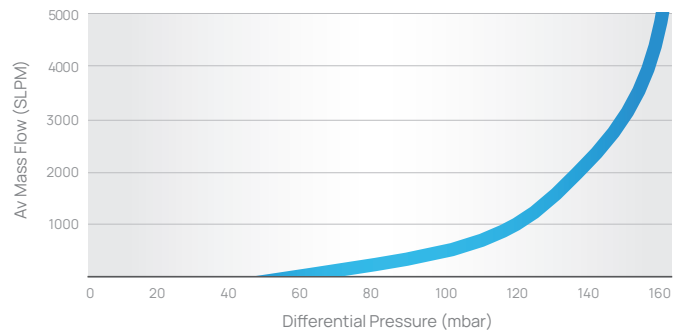
Flow Characteristics

The functional test for the standard seat design evaluates its performance in terms of opening and flow characteristics. This includes measuring the force required to open the seat, the response time, the smoothness of operation, the flow rate, the pressure drop, and any potential leakage when the seat is in the open state.

Opening Characteristics



Flow Characteristics



For Conversion Purposes:
1mbar = 1hPa >> 1 cm of water

Specifications

 Compound VL1001M1005	 Polymer Silicone	 Color Gray	 Tg(DSC) -60°C	 Media Resistance Exposure to automotive fluids and contaminants
 Flammability UL94-V0	 Functional Tested 500°C / 10 sec	 Ingress Protection IP68	 Tmax (Continuous) +200°C	

About Vernay

Vernay has been a technology leader in the design, development and manufacture of customized flow-control components since its founding in 1946, with products that play a vital role in millions of automobiles, medical devices and consumer products. Today, Vernay produces more than one billion components per year, drawing from a library of more than 33,000 elastomeric materials and compound formulations. Vernay operates around the world, with locations in the U.S., Netherlands, Italy and China.

For more information, contact Sales@Vernay.com or visit www.vernay.com.

DISCLAIMER: Functional performance is measured under laboratory conditions according to Vernay Test Protocols and relates only to the samples tested. Vernay recommends validating fitness for use of the selected parts in their specific application. The test data in this document are not for specification purpose. Media resistance and service temperature range are indicative. Please contact Vernay for specific media and temperature exposures. This is provided for general information purposes only. It is accurate and correct to the best of Vernay's belief; however, Vernay disclaims any warranties, expressed or implied, as to this information and assumes no obligation or liability therefore. Much of this information is proprietary to Vernay and by providing this information Vernay does not waive or release any patent, copyright, or other proprietary right it may own in this information.