

A detailed 3D rendering of an IDV™ Safety Valve. The valve is a dark, cylindrical component with two flanged ends. The top flange has six bolt holes. The bottom flange is larger and features a central opening with a threaded interior. The valve is shown at an angle, highlighting its compact design.

IDV™ Safety Valve

# The **IDV™** Safety Valve

Advanced technology – compact, lighter and higher flow capacity than a typical API Safety Relief Valve





# IDV™ Safety Valve

The IDV™ Safety Valve is a self-reclosing safety pressure relief valve with the same functional performance attributes as a traditional Safety Relief Valve (SRV), however, with inline configuration, instead of an angle body configuration.

This inline design allows the IDV to offer up to 1.5 times the capacity of a conventional API Safety Relief Valve. The increased capacity allows engineers and operators to optimize their pressure safety systems and, in many applications, reduce the piping configuration (line size) by one or more nominal sizes.

The IDV has been installed in over 10,000 processes worldwide over 25-years, an established alternative to the safety relief valve that meets the same codes and standards.

## Features

- In-line design with the same inlet and outlet flange connection size.
- Compact and light weight compared to traditional API safety relief valves.
- Superior capacity to API safety relief valves.
- ANSI/ASME B 16.5 and International flange connections.
- Optional integrated rupture disk at Inlet of valve.
- Smaller size; may be able to use a smaller valve size.
- Convenience of an in line flanged design.
- Install horizontally or vertically.
- Set pressure independent of back pressure, suitable for variable back pressure applications.

## Flow Capacity

Flow capacity is determined by a combination of coefficient of discharge (Kd) and flow area (A). Kd is ASME certified as 0.7.

*Note: Relief Valve flow area is smaller than inlet piping size.*

## Materials

**The IDV Body:** can be manufactured using any cast alloy that meets application, ASME / CE, or other requirements.

**Internals:** Any alloy that can be machined.

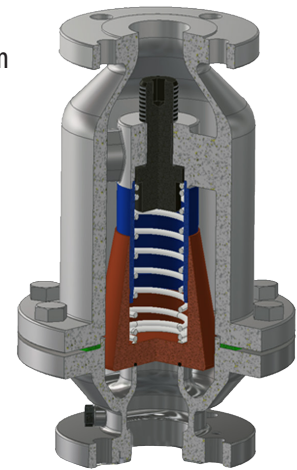
**The Soft Seat:** Viton, Silicone and other 'O' ring options.

## IDV™ Safety Valve Models

IDV	Conventional / Standard (IDV) Valve
IDV-B	IDV with a Bellows to isolate spring
IDV-C	Standard IDV with Rupture Disk Cassette inserted into the inlet
IDV-H	Standard IDV with an integrated Safety Head Outlet Flange
IDV-CB	IDV-C with bellows
IDV-HB	IDV-H with bellows

## IDV STANDARD:

Spring Protected: Spring is isolated from flow path and process medium by piston arrangement.

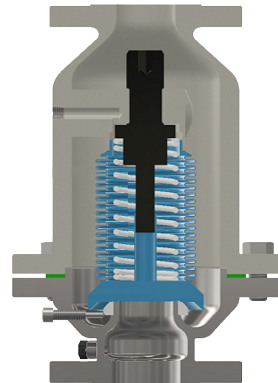


*Cutaway view of conventional IDV*

## IDV BELLOWS IDV-B:

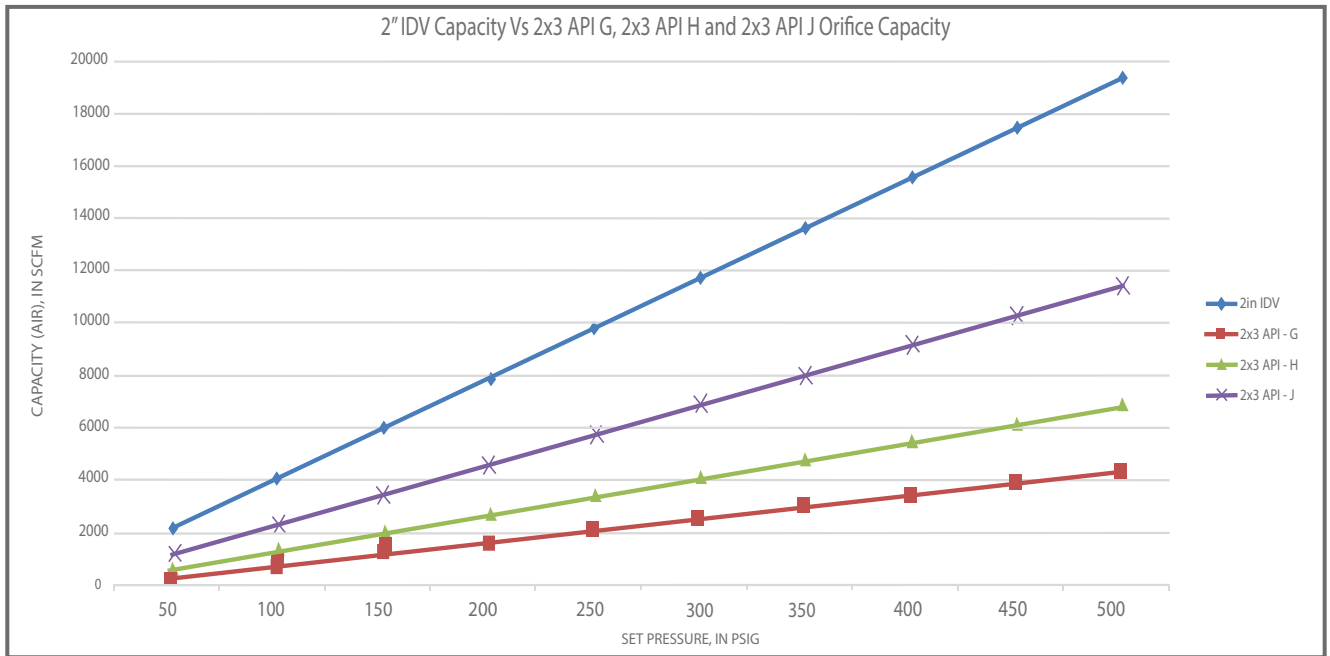
Spring Protected: Spring is not in the flow path. It is surrounded by a bellows arrangement to keep media out.

Back Pressure: Side port to balance valve to atmospheric pressure.

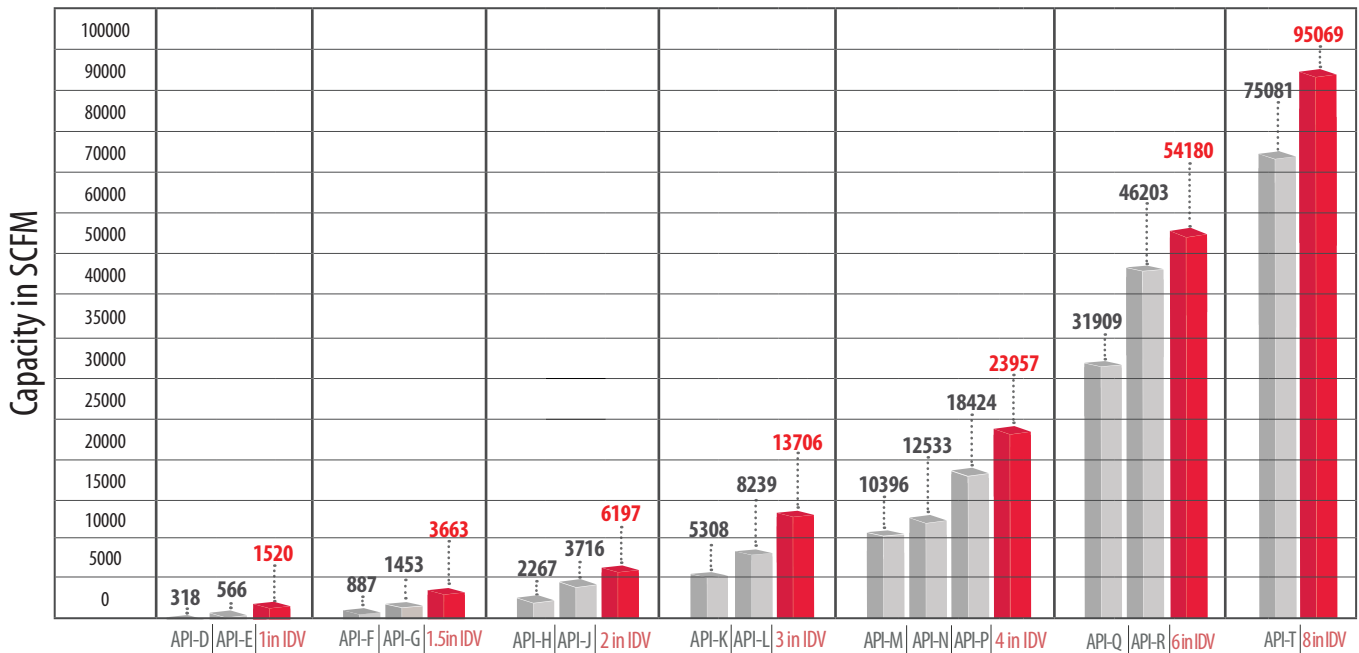


*Cutaway view of IDV-B*

## API Orifice Capacity Comparison Chart: IDV flow capacity is much greater.



## Capacity Comparison of IDV with API Orifice at 150 psig: Sizes 1" to 8" (DN25 to DN 200)



Flow capacity is greater than standard API safety relief valves. For all given IDV sizes, the next standard API valve would be required to achieve the same capacity rating.



# IDV Safety Valve Combined with Rupture Disk Devices

## Inline Design Valve Isolation

Codes & Standards permit the use of a rupture disk device at both an IDV inlet and outlet. This combination, first recognized by the ASME Boiler & Pressure Vessel Code in the United States has been echoed in the practices of EN 4126-3 in Europe and internationally by ISO 4126-3. The combination of rupture disk devices and safety relief valves continues to grow driven by the user benefits of valve isolation:

- Optimal leak tightness
- Increased operating pressure
- Extended valve life
- Reduced valve maintenance
- Improved corrosion resistance
- Reduced Thermal Footprint
- Increased reliability

Optimal Leak Tightness – Isolating safety relief valves with rupture disk devices reduces the risk of fugitive emissions. The IDV meets API Standard 527 requirements for soft seat valve leak tightness. A solid metal rupture disk used at the inlet of the relief valve acts as an additional barrier to leakage.

Increased Operating Ratio – The most advanced reverse buckling disk technology permits operation to 95% of marked burst pressure (100% of minimum burst pressure) isolating a safety relief valve from the most aggressive pressure service conditions.

Extended Valve Life – The process barrier provided by the rupture disk device prevents product buildup from adhering to mechanical components of the valve. The process media does not come in contact with internal surfaces and parts of the valve, it will remain in new condition until called upon to relieve an overpressure event.

Reduced Valve Maintenance – With the valve internals not normally exposed to process contamination, they remain in 'like new' condition, allowing longer periods between major overhauls & less maintenance activity at each mandated cycle.

Improved Corrosion Resistance – The initial cost of a safety valve can be reduced by selecting less costly material and isolating it with a rupture disk device. As an example, a Carbon Steel valve with Hastelloy® trim might save 65% compared to the cost of a Hastelloy® valve. The savings will fund the rupture disk device manufactured from Hastelloy®.

*Hastelloy® is a registered trademark of Haynes International, Inc.*

Reduced Thermal Footprint – Rupture disks have typically a much lower thermal mass than a valve, protecting the relief system from product accumulation under normal service conditions.

Increased Reliability – The simplicity of rupture disk technology with no moving parts and no maintenance requirements adds to the reliability of relief system design. The integrity of a safety relief valve that remains in 'like new' condition under normal process operating conditions maximizes the opportunity for valve performance to meet the planned design safety requirements.



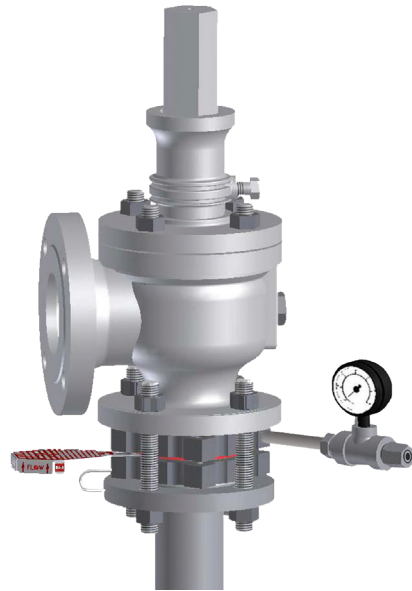
### **IDV-H**

*Integrated Safety Head Outlet Flange with Rupture Disk*

## Isolation using Rupture Disk Devices

BS&B recommends the Sta-Saf® system reverse buckling rupture disk devices when isolating safety relief valves. Sta-Saf products cover the full range of IDV safety valve set pressures.

The Sta-Saf system provides the user with a solid metal rupture disk designed for non fragmentation and optimum leak tightness. The pretorqued safety heads of the Sta-Saf system allow for removal of the rupture disk device from service for inspection, cleaning and then reinstallation provided the capscrews remain in place to secure the rupture disk to the seat in the safety head.



*Above: Rupture Disk / Safety Relief Valve Shown in a Traditional API Configuration.*

## Available Integrated Solutions for Isolating IDV Safety Valves

BS&B offers three integrated solutions for isolating IDV Safety Valves:

- 1) IDV-C: Standard IDV model with a rupture disk cassette inserted into the inlet. This cassette is a customized, ready-to-install design that simplifies installation and assures leak tightness with its welded construction.
- 2) IDV-H: Standard IDV model with an integrated Safety Head Outlet Flange. The integral construction removes a potential leak path when compared to a separate safety head.
- 3) IDV-CB and IDV-HB: Bellows version of the IDV-C and the IDV-H. The Bellows covers the spring and isolates the spring from internal pressure while protecting the spring from corrosion and other potentially harmful elements. The bellows provides isolation from back pressure.



**IDV-C**  
*Rupture Disk  
Cassette Insert*



## IDV Typical Weight Comparison

IDV Size	IDV Weight in LB	SRV Size	SRV Weight in LB	Weight Comparison (%)
1"	40	1" x 2"	42	95%
1.5"	50	1.5" x 2"	58	86%
2"	80	2" x 3"	84	95%
3"	126	3" x 4"	146	86%
4"	182	4" x 6"	260	70%
6"	294	6" x 8"	412	71%
8"	406	8" x 10"	660	62%
10"	568	10" x 14"	1135	50%

## Codes and Standards

BS&B leads in the design and manufacture of pressure relief devices and sets the standards in the pressure relief industry. BS&B has been responsible for originating patents on all rupture disk designs and continues its commitment to innovation.

BS&B pressure relief devices are manufactured in conformance with the requirements of the following international codes and standards:

- ASME Sections XIII (UV stamped) - USA
- EC Pressure Equipment Directive (CE marked) 2014/68/EU - European Union
- EC Atex Directive 2014/ 34/ EU
- Canadian Registration (CRN marked) - Canada
- EN / ISO 4126-2 - Europe / International
- EN / ISO 16852:2016 (flame arresters) - Europe / International
- EN / AS 9100 (aerospace)
- NFPA 67/ 68/ 69
- TUV AD Merkblatt A1 - Germany
- SVTI - Switzerland
- Stoomwezen - The Netherlands
- ISO 9001 - International
- MLSE [GB567-2012] - China
- KOSHA - Korea
- IATF 16949 - International
- ISO 14001 - International
- KGSC - Korea

## ASME Certification

Capacity Tests:	<i>Sec. XIII at BS&amp;B on Aug. 31, 2017</i>
Method of Establishing Relieving Capacity:	<i>Flow Capacity, Kd</i>
Certified Value:	<i>0.700 Unitless</i>
Test Medium:	<i>Air</i>
Certified Medium:	<i>Air/Gas</i>
Set pressure Definition:	<i>Pop</i>
Blowdown:	<i>Fixed</i>

## Scope of Nominal Size and Set Pressure Ranges

Scope of Nominal Size and Set Pressure Ranges:					
IDV Size		Flow Area	Set Pressure Range	Media	Code Section
inlet NPS	Outlet NPS				
1	1	0.66 sq in	15-500 psi	Air	XIII
1.5	1.5	1.59 sq in	15-500 psi	Air	XIII
2	2	2.69 sq in	15-500 psi	Air	XIII
3	3	5.95 sq in	15-500 psi	Air	XIII
4	4	10.40 sq in	15-500 psi	Air	XIII
6	6	23.52 sq in	15-500 psi	Air	XIII
8	8	41.27 sq in	15-500 psi	Air	XIII

## Required Specifications Necessary to Quote IDV

Contact BS&B to discuss specification requirements.

Preferred material of construction	
Optional material of construction	
Vertical or Horizontal installation	
Codes and standards	
Inlet and outlet connection	
Capacity required (SCFM)	
Set Pressure	
Operating Pressure	
Vacuum	
Back pressure	
Flange connection (ANSI, DIN, JIS)	

## Preferred Seal Material

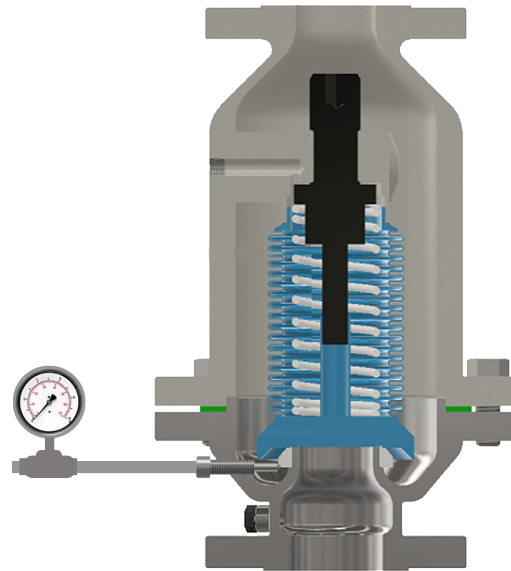
<input type="checkbox"/> Viton®
<input type="checkbox"/> Buna N®
<input type="checkbox"/> Silicone

*Viton® is a registered trademark of The Chemours Company. Buna N® is the registered trademark of Pittway Corporation.*



**Per ASME Section XIII part 8.2(d) Rupture Disk Device Installed Between a Pressure Relief Valve and the Pressurized Equipment**

The space between the rupture disk device and the pressure relief valve shall be provided with a pressure gage, try cock, free vent, or other suitable telltale indicator. This arrangement permits detection of disk rupture or leakage. Users are warned that a rupture disk will not burst at its marked bursting pressure if back pressure builds up in the space between the disk and the pressure relief valve, which will occur should leakage develop in the rupture disk due to corrosion or other cause.



**The Most Comprehensive Portfolio of Overpressure and Explosion Protection Products from One Manufacturer**

<p><b>RUPTURE DISK DEVICES</b></p>	<p><b>CUSTOM ENGINEERED PRODUCTS</b></p>	<p><b>SPECIALTY VALVES</b></p>	<p><b>INDUSTRIAL EXPLOSION PROTECTION</b></p>	<p><b>FLAMESAF™ FLAME ARRESTERS &amp; BREATHER VENTS</b></p>
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[www.bsbsafety.co](http://www.bsbsafety.co)



## AMERICAS

### Tulsa, OK USA

T: +1 918 622 5950  
F: +1 918 665 3904  
E: sales@bsbsystems.com

### Houston, TX USA

T: +1 713 682 4515  
F: +1 713 682 5992  
E: sales@bsbsystems.com

### Minneapolis, MN USA

T: +1 952 941 0146  
F: +1 952 941 0646  
E: sales@bsbipd.com

### Edmonton, AB Canada

T: +1 780 955 2888  
F: +1 780 955 3975  
E: contacts@bsbprocess.com

### Monterrey, Mexico

T: +011 52 81 8299 5861  
T: +011 52 81 8299 5862  
E: sales@bsbsystems.com

### Sao Paulo, Brasil

T: +55 11 2084 4800  
F: +55 11 2021 3801  
E: sales@bsbbrasil.com

## EUROPE, MIDDLE EAST & AFRICA

### Limerick, Ireland

T: +353 61 484700  
F: +353 61 227987  
E: sales@bsb.ie

### Düsseldorf, Germany

T: +49 211 930550  
E: info@bormann-neupertbsb.de

### Manchester, UK

T: +44 161 955 4202  
F: +44 161 870 1086  
E: sales@bsb-systems.co.uk

### The Hague, The Netherlands

T: +31 70 362 2136  
F: +31 70 360 4724  
E: info@bsbsystems.nl

### Copenhagen, Denmark

T: +45 3318 9000  
F: +45 3318 9001  
E: info@bsbsystems.dk

### United Arab Emirates

T: +971 (0) 55 518 0314  
T: +971 (0) 55 518 0916  
F: +971 (0) 2 558 9961  
E: sales@bsbsystems.ae

## ASIA PACIFIC

### Singapore

T: +65 6513 9780  
F: +65 6484 3711  
E: sales@bsb.com.sg

### Yokohama, Japan

T: +81 45 450 1271  
F: +81 45 451 3061  
E: information@bsb-systems.co.jp

### Seoul, South Korea

T: +82 2 2636 9110  
F: +82 2 2636 9120  
E: sales@bsbsystems.kr

### Shanghai, China

T: +86 21 6391 2299  
F: +86 21 6391 2117  
E: sales@bsbsystems.com

### Chennai, India

T: +91 44 2450 4200  
F: +91 44 2450 1056  
E: sales@bsbsystems.com



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