



Installation Instructions

Welded Rupture Disk Assemblies

Welded Rupture Disk Assemblies

Safety and Caution	2
Inspection and Replacement	3
Before Installation	4-5
Installation Types	6-7
Returning Product	8
Warranty	9

BS&B welded assemblies are used in a multitude of industries where design engineers specify customized overpressure relief solutions to meet required footprints. BS&B manufactures welded assemblies using a variety of rupture disks and integrates the disks with customized holders unique to the application.

DANGER: Rupture disks are intended to provide a pressure relief opening. This rupture disk is designed to burst at a specified temperature and pressure, thereby relieving excess pressure (or preventing excessive vacuum in a system). It is imperative that this rupture disk be properly installed and safely vented in order to avoid bodily injury, damage to property, and / or pollution. The BS&B companies supply disks selected by their customers, which are manufactured in reliance upon information and specifications supplied by the customer. BS&B is not liable for any damage resulting from improper installation, improper system design, unsafe venting, or other factors beyond BS&B's control. Do not locate the rupture disk device where personnel, equipment or property will be exposed to released product and pressure. Handle carefully, disk and tag may have sharp edges.



Safety and Caution

Only competent, trained personnel should install rupture disk safety devices in accordance with these installation instructions.

DANGER: To avoid a hazardous or fatal situation, please ensure all pressure or vacuum is released from your process/system/equipment before installation of any rupture disk device.

DANGER: Do not locate the rupture disk where personnel will be exposed to discharged process media and/or disk fragmentation. Consult BS&B for more information on disk fragmentation.

CAUTION: Provide adequate support for piping and connections to absorb recoil/reaction forces when the disk ruptures.

CAUTION: Rupture disks exposed to high temperature gases or liquids on the process side of the disk are extremely hot. When these hot disks are introduced to fluids cooler than the disk temperature (example: rain, sleet, snow in atmospherically vented applications), thermal shock may occur, resulting in premature and incomplete openings (well below the rated burst pressure). A suitable pipe cover or piping design is required to protect atmospherically-exposed rupture disks.

CAUTION: Corrosion and process conditions may affect disk performance and necessitate more frequent replacement.

CAUTION: When the disk ruptures, the resulting shock wave may affect the operating performance of downstream equipment.

CAUTION: Do not reinstall a disk that had been removed from a safety head even if it has not ruptured. When stresses in the disk are relieved by unbolting, the impression in the seating area taken by the disk during its original installation may prevent sealing and affect disk performance if reinstalled.

CAUTION: Do not add any coatings such as paint or liners to either side of the rupture disk.

Note: Do not remove rupture disks from packaging for inspection until ready to install.

Note: Only threaded inlet/outlet configured rupture disk assemblies may be removed from service for inspection and re-installed provided the disk and threads are in good condition.

Note: Welded assemblies come in various configurations. Multiple methods for installation may apply. Please adhere to any supplemental special instructions that may have been provided with this product.

Note: Disassembling, reworking, or remarking in any way voids the warranty of the welded assembly

Inspection and Replacement

Rupture disks are neither designed nor intended to be “permanent” products. Periodic inspection and replacement of disks are strongly recommended. A rupture disk should be replaced, for example, if damaged, corroded, subject to excessive cycling or fatigue, pitted, accumulating customer product, or otherwise subject to any condition that may impair or impede the operation of the disk.

When inspecting rupture disk assemblies, the entire assembly may be removed, inspected, and, if determined to be fit for continued use, reinstalled while ensuring they are properly reinstalled. Rupture disks assemblies installed in a fashion where a bite seal or metal-to-metal seal is made with the mounting face of the assembly are not suited for inspection by removal and re-installation.

Neither damage to the disk or assembly body should be subject to further use. Customers may request BS&B’s inspection of assemblies. In some instances, BS&B may recondition assemblies to provide for continued use.

Due to varying customer applications and processes, BS&B is unable to provide a uniform inspection and replacement period recommendation for assemblies. At the minimum, BS&B recommends an inspection cycle of no longer than 24 months or the standard inspection cycle of the owner / operator of the facility, whichever is more frequent.

Process pressure and / or temperature fluctuations may cause a rupture disk to activate prematurely due to excessive cycling and characteristic fatigue. To minimize potential releases and / or downtime associated with cycle fatigue activations, BS&B recommends a maximum replacement cycle of 36 months from the date of installation unless a BS&B “Relief Device Manager” or a BS&B-approved real-time monitoring system is used that is capable of sampling and identifying pressure spikes or excursions occurring in the single millisecond range.

Before Installing a Welded Assembly

Inspection and Replacement

Welded rupture disk assemblies are comprised of a disk component, an inlet and outlet welded together to form a prefabricated rupture disks device (assembly). The inlet and outlet or holder is generally referred to as the assembly “body”. A vast majority of welded assemblies are intended to be a one-time use device (ie. once the disk activates, the entire assembly is discarded). Common welded assemblies can be fabricated with various threaded or tube stub connections on either the inlet, outlet or both sides. Another common style of welded assemblies is the Cassette. Cassettes (as shown below) are designed with a simple inlet and outlet allowing them to be quickly installed. However, various methods may exist for installing a Cassette assembly.

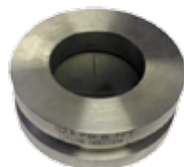
Welded Assembly Examples



Welded Threaded Connections

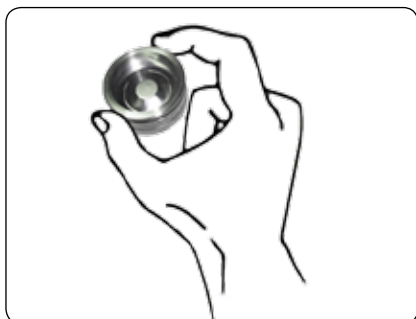


Welded Tube Stub Connections



Welded Cassette

Inspect Safety Head



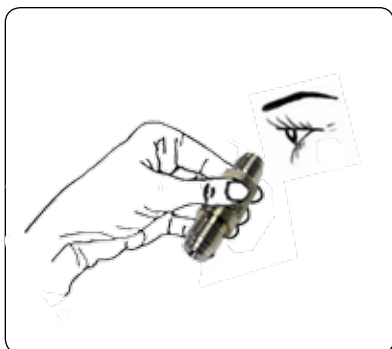
- Handle carefully holding the disk by the perimeter only. Examine disk surfaces (if visible) for nicks, dents, scratches and foreign material which can damage the disk.



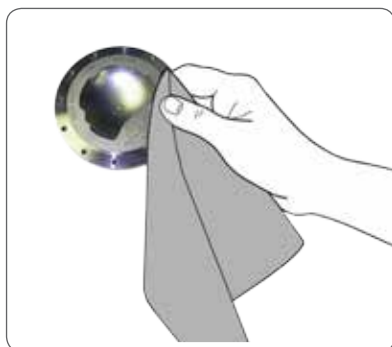
- **Do not install a damaged disk** - Burst pressure may be affected by damage or disk could leak. Contact BS&B if you believe to have a damaged product. Most damage is visible by photograph. Installation may result in leakage or affect burst pressures.

Before Installing a Welded Assembly

- Continued



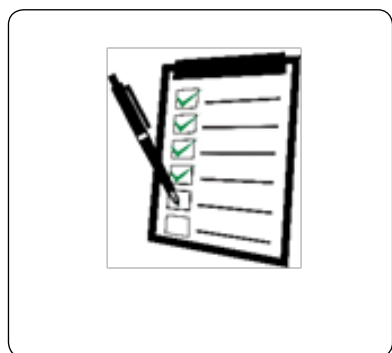
- Inspect body surfaces or connection threads for damage avoiding contact with the disk membrane - dirt or grit can impede the installation.



- Clean if necessary. If metal-to-metal contact surfaces are nicked, an emery or crocus cloth may be used prior to installation.



- The rupture disk and safety head must not be machined or modified in any way.



- Ensure area where the rupture disk assembly will be installed is cleaned and free from debris. Depending on the type of installation you perform, additional actions may be required.

CAUTION: It is important to recognize the direction or orientation in which a welded assembly is installed. Depending on the product size and confirmation "Flow" or arrows will be marked on the body to indicate the direction of flow for the process media. In the instance where the welded assembly is too small to have marked indicators, please see supplemental installation instructions, drawings or other specifications for more information on product orientation to your system.

Installation Types

Welded assemblies can come in an unlimited array of configurations, and therefore can be installed in an unlimited number of applications. The most common installation scenarios are described below. If you have a unique application please consult BS&B for proper use and installation of the product.

- Common Threaded
- Tube Stubs
- Welded
- Flanged/Bolted
- Hold down Nut/Clamped

Care should be taken when installing the assembly to ensure the disk membrane is not wrinkled or dented throughout the process. If this occurs remove the assembly from the system and install a new one.

Inspection and Replacement

Welded assemblies that are installed via threaded connection shall be installed with standard torque values consistent with NPT, BSP, SAE, and other related standards. When applicable the part should only be torqued using a calibrated torque wrench or tool contacting on the hex or wrench flats.

- Tapered threads may use an appropriate sealing aid such as pipe putty or PTFE tape. Common tapered threads include NPT or BSPT.
- Parallel or straight threads may use an appropriate sealing component such as o-rings, gasket, or other sealing component. Common parallel thread include SAE, BSP, VCR or A.N.

Tube Stubs

Welded Assemblies that are installed with tube stub connections shall be installed with the proper size nuts and ferrules. Install using nut & ferrule manufacturers recommended torque and methodology to seal the joint properly. Below are some examples of tube connection types.

D. Welded Assemblies that are installed with tube stub connections shall be installed with the proper size nuts and ferrules. Install using nut & ferrule manufacturers recommended torque and methodology to seal the joint properly.

E. Welded assemblies that are connected to their application via another weld shall be handled carefully to avoid altering the burst pressure. If part is being welded into place ensure that the rupture disk does not increase in temperature over 500°F at any point in time. If this occurs the pressure the disk activates can be compromised. Good welding practices should be used to ensure the assembly is installed into the system both leak free and structurally sound.

F. Welded assemblies that are installed between flanges shall be torqued to proper values for that flange size and rating. Proper gaskets, rings, etc. shall be used to ensure a leak free seal. Bolts or studs shall be torqued in a cross-diagonal pattern in increments of $\frac{1}{4}$ the total torque until proper torque is reached.

G. If a welded assembly is being held in place by a hold-down nut or clamped into place by threaded nut a proper seal shall be used to ensure a leak free seal is achieved.

Returning Product

CAUTION: All rupture disk assemblies being returned for evaluation should be handled with extreme care even after disk activation. This will aid in any investigatory activities performed by BS&B Safety Systems.

When returning product to BS&B, it is best to return it in the original packaging it was supplied in. If original packaging is no longer available or if the product no longer fits (e.g. activated disk petal protruding from assembly body) please photograph product as-is before securing it protective packaging. Product returned to BS&B Safety Systems shall be done through one of the below scenarios:

1. Return Material Transaction (RMT)

Product/s returned under an RMT is done so under the pretense that there has been a potential failure of the product in service, failure of the product to meet your specification prior to use or for product exchanges. As required, RMTs will undergo an engineering evaluation of the potential failure.

2. Customer Material Transaction (CMT)

Product/s returned under a CMT is done so at the customer's request for additional testing and evaluation beyond the original scope of supply or for BS&B Safety Systems use in refurbishments or new product manufacturing.

WARRANTY (PG 11)

Limitations of Warranties – BS&B Safety Systems, L.L.C and its affiliate companies (BS&B) warrants their products, when properly installed, used and maintained by the original purchaser, against defective workmanship and materials for a period of twelve (12) months from the date of shipment. Purchaser's failure to use this product in strict compliance with all material operating specifications provided to BS&B by purchaser prior to BS&B production or shipment of this product shall void this warranty. Rupture disks are warranted solely to burst within specified pressure ranges at temperatures specified at the time of sale.

Where pressure relief or other products used by Buyer involve multi-part assemblies, each part must be manufactured by BS&B. BS&B specifically disclaims any warranties and any and all liability for damages, either direct or indirect, incidental or consequential, arising from the use of rupture disk assemblies (e.g. rupture disk and rupture disk holder), explosion vent assemblies (e.g. vent and safety frame) or other assemblies not wholly comprised of BS&B manufactured products.

BS&B does not warrant any article not manufactured by BS&B. BS&B does not warrant this product against loss or damage caused directly or indirectly by improper pressure relief system design; by the improper use, maintenance or installation (including improper torque) of this product; or by corrosion erosion or malfunction caused by acids, chemicals, fumes, rust, dirt, debris, thermal shock, shock waves or other external agencies over which BS&B has no control.

THE EXPRESSED WARRANTIES HEREIN GIVEN ARE EXCLUSIVE AND IN LIEU OF ALL WARRANTIES EXPRESSED OR IMPLIED, BY OPERATION OF LAW OR OTHERWISE, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. BUYER'S SOLE AND EXCLUSIVE REMEDY FOR BREACH OF ANY WARRANTY SHALL BE, AT BS&B OPTION, THE REPAIR OR REPLACEMENT OF THE PRODUCT, F.O.B. TULSA, OKLAHOMA, OR LIMERICK, IRELAND.

Liability Limitations – BS&B manufactures and supplies their products in reliance upon information and specifications provided by its customers. BS&B specifically disclaims any and all liability, of whatever nature, resulting or arising from Buyer's failure to disclose fully all material operating conditions, design parameters, process components, or system or vessel requirements, or from any misrepresentations or omissions by Buyer, Buyer agrees to indemnify and hold harmless BS&B for all costs, loss, liability or damage arising or resulting from BS&B manufacture or supply of this product in accordance with Buyer's specifications or requirements.

BS&B AGGREGATE TOTAL LIABILITY TO BUYER FOR ANY AND ALL LOSS OR DAMAGE ARISING OUT OF BUYER'S USE OF, OR INABILITY TO USE, THE PRODUCT SHALL IN NO EVENT EXCEED THE PURCHASE PRICE OF THE PRODUCT OR \$1,000.00, WHICHEVER IS LESSER, BS&B SHALL NOT BE LIABLE FOR PERSONAL INJURY OR PROPERTY DAMAGE ARISING OUT OF BUYER'S PURCHASE, INSTALLATION OR USE OF THE PRODUCT, AND IN NO EVENT SHALL BS&B BE LIABLE FOR SPECIAL, INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES RESULTING FROM ANY SUCH CAUSES.

Edmonton, AB Canada**T** +1 780 955 2888**F** +1 780 955 3975**E** contacts@bsbprocess.com**Tulsa, OK USA****T** +1 918 622 5950**F** +1 918 665 3904**E** sales@bsbsystems.com**Monterrey, Mexico****T** +011 52 81 1958 0560**F** +011 52 81 1958 0560 138**E** sales@bsbsystems.com**Minneapolis, MN USA****T** +1 952 941 0146**F** +1 952 941 0646**E** sales@bsbipd.com**Houston, TX USA****T** +1 713 682 4515**F** +1 713 682 5992**E** sales@bsbsystems.com**Sao Paulo, Brasil****T** +55 11 2084 4800**F** +55 11 2021 3801**E** sales@bsbbrasil.com**Limerick, Ireland****T** +353 61 484700**F** +353 61 227987**E** sales@bsb.ie**Manchester, UK****T** +44 0 161 955 4202**F** +44 0 161 870 1086**E** sales@bsb-systems.co.uk**Yokohama, Japan****T** +81 45 450 1271**F** +81 45 451 3061**E** information@bsb-systems.co.jp**Moscow, Russia****T** +7 495 747 5916**F** +7 499 133 4394**E** sales@bsbsystems.ru**The Netherlands****T** +31 70 362 2136**F** +31 70 360 4724**E** info@bsbsystems.de**Frankfurt, Germany****T** +49 6022 26 2310**F** +49 6022 26 2311**E** info@bsbsystems.de**United Arab Emirates****T** +971 2406 9603**F** +971 2406 9810**E** sales@bsbsystems.ae**Shanghai, China****T** +86 21 6391 2299**F** +86 21 6391 2117**E** sales@bsbsystems.cn**Singapore****T** +65 6513 9780**F** +65 6484 3711**E** sales@bsb.com.sg**Chennai, India****T** +91 44 2812 8900**F** +91 44 2811 1902**E** sales@bsbsystems.com**BSBSystems.com | BSB.ie***Visit our website for the most complete, up-to-date information*