



BS&B SAFETY SYSTEMS, L.L.C.
BS&B SAFETY SYSTEMS LTD.

Burst Alert[®] Sensors



*U.S. patents 4,978,947; 5,551,471
and other international patents apply.*

For Immediate Warning of a Pressure Relief Event

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Burst Alert[®] Sensors

Coincident Rupture Disk

Burst Pressure for Burst Alert[®] Sensors

Table 1

Size of Rupture Disk		Minimum Coincident Pressure for BAS+ Series Sensors	
in	mm	psig	barg
1	25	14	0.96
1 1/2	40	12	0.83
2	50	7	0.48
3	80	5	0.34
4	100	5	0.34
6	150	3	0.2
8	200	3	0.2
10	250	3	0.2
12	300	3	0.2

Table 2

Size of Rupture Disk		Minimum Coincident Pressure for KBA Series Sensors	
in	mm	in WC	millibar
1	25	N/A	N/A
1 1/2	40	N/A	N/A
2	50	8.5/13.5	21/34
3	80	7.5/8.5	19/21
4	100	5.5/7.5	14/19
6	150	8.5/10.5	21/26
8	200	5.5/6.5	14/16

Note: The first pressure value applies to temperatures from -40°F-90°F (-40°C-32°C). The second pressure value applies from 90°F-175°F (32°C-79°C).

Table 3

Size of Rupture Disk		Maximum pressure activation for LDAS+ Series Sensors	
in	mm	psig	barg
1	25	N/A	N/A
1 1/2	40	N/A	N/A
2	50	12	0.83
3	80	8.7	0.6
4	100	8.7	0.6
6+	150	8.7	0.6

Note: These pressure values indicate the maximum pressure buildup upstream of the sensor before activation to detect leakage and/or operation of a pressure relief device.

Table 4

Size of Rupture Disk		Minimum Coincident Pressure for BAS Series Sensors	
in	mm	psig	barg
1	25	20	1.38
1 1/2	40	10	0.69
2	50	5	0.34
3	80	2.5	0.17
4	100	1.6	0.11
6+	150	1	0.069

Armored Version
(ABAS+ shown)



Sensor Type

Features

BAS+™
BASS+™

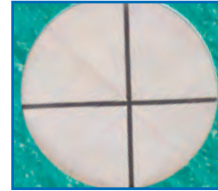


Armored:
ABAS+™
ABASS+™

Note: Two Reconnect Stops™ can be seen where the breaking ends of the Tantalum conductor wire run into the gasket (bottom of photo). The Stops provide electrical insulation that minimizes the risk of sensor reconnection after the pressure relief event. The wide conductor path separation further reduces the risk of electrical reconnection—there is insufficient live conductor material after perimeter opening of sensor to span the gap.

- ◆ Superior perimeter fail
- ◆ Polyimide film
- ◆ Tantalum conductor wire
- ◆ Dual path conductor
- ◆ Reconnect Stops™
- ◆ Wide conductor separation

KBA™
KBAS™



Armored:
AKBA™
AKBAS™

- ◆ Offset center fail
- ◆ PTFE film
- ◆ Tantalum conductor wire
- ◆ Dual path conductor

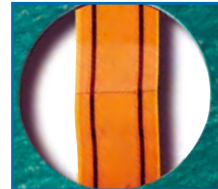
KBA-S™
KBA-SS™



Armored:
Not Available

- ◆ Offset center fail
- ◆ PTFE film
- ◆ Tantalum conductor wire
- ◆ Dual path conductor

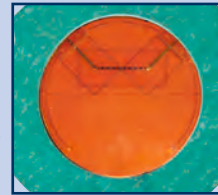
DAS™
DASS™



Armored:
ADAS™
ADASS™

- ◆ Center fail
- ◆ Polyimide film
- ◆ Tantalum conductor wire
- ◆ Dual path conductor
- ◆ Domed to accommodate disk dome

LDAS+™
LDASS+™

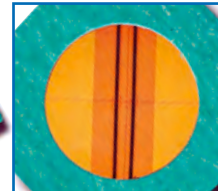


Armored:
ALDAS™
ALDASS™

The LDAS family of sensors detects both burst and leakage conditions.

- ◆ Perimeter fail
- ◆ Polyimide film
- ◆ Tantalum conductor wire
- ◆ Single path conductor
- ◆ Dual failure point
- ◆ Reconnect Stops™

BAS™
BASS™



Armored:
Not Available

- ◆ Center fail
- ◆ Polyimide film
- ◆ Tantalum conductor wire
- ◆ Dual path conductor

Note: Underlined sensor types are provided with SmartDisk™ compatible connectors. All other sensors are provided with pigtail end connections unless specified at the time of order.

Use with the following Rupture Disk type

Sure-Saf	CSI, CSR
Sta-Saf	Sigma EXL, Sigma, SK _R ⁺ , LPS, RLS, S-90, JRS, FRS
High Pressure Eco-Saf	ECR, ECV, ECT, V/ECR (see Table 1)
Nu-Saf	XN-85, XN disks in safety head types NF-7RS and NF-7R only. Also type LCN at higher pressures (see Table 1), and XN-85S and XN disks sizes 1"~3"/25mm~80mm in safety head types NX-7R and NXV-7R.
High Pressure Graphite Disks	* MB, MBV, AMB, AMBV, IMB, AIMB, IMBL, AIMBL, RE, REV (see Table 1)
Other Disks	GFN, B, BV, D, DV, SVI, RB-90 – except for special reduced height safety heads that do not enclose the disk dome, when DAS family sensors should be used.

+ do not use BAS+ series sensor when installed in S90-7R safety head.

* when the sensor is installed on the atmospheric/ vent side of the rupture disk.

Vac-Saf	DKB, P/DKB, AVB (see Table 2)
Low Pressure Eco-Saf	(see Table 2)
Low Pressure Graphite Disks	(see Table 2)

Vac-Saf (sanitary/aseptic)	VKB, P/VKB, AVB-ST, P/AVB-ST (see Table 2)
Eco-Saf (sanitary/aseptic)	ECR-S, V/ECR-S, V/ECT-S (see Table 2)

Type GCR-S sanitary/aseptic rupture disks with integral burst alert sensors and type SAS Sanitary/Aseptic Burst Alert Sensors are detailed in catalogs 77-4014 and 77-4015.

Note: KBA-S family sensors use standard sanitary/aseptic gasket materials such as Viton, Silicone and EPDM.

Large Size Tension Loaded Disks	XN-85S and XN disks 4"/100mm and larger used in NX-7R or NXV-7R safety heads. B, BV, D, DV, XN-85 disks used in special reduced height safety heads that do not enclose the disk dome. Atmospheric vent type disks: AV, AVV, AVE, AVEL.
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The response pressure capability of the DAS family of sensors matches the minimum burst pressure for the AV disk.

Sure-Saf	CSI, CSR
Sta-Saf	Sigma EXL, Sigma, SK _R ⁺ , RLS, S-90 and high pressure LPS, JRS and FRS (see Table 3)
High Pressure Eco-Saf	ECR, ECV, ECT, V/ECR (see Table 3)
Nu-Saf	XN-85, XN disks in safety head types NF-7RS and NF-7R only. Also type LCN at higher pressures (see Table 3), and XN-85S and XN disks sizes 1"~3"/25mm~80mm in NX-7R and NXV-7R safety heads.
High Pressure Graphite Disks	* MB, MBV, AMB, AMBV, IMB, AIMB, IMBL, AIMBL, RE, REV (see Table 3)
Other Disks	GFN, B, BV, D, DV, SVI, RB-90 – except for special reduced height safety heads that do not enclose the disk dome.

+ do not use LDAS+ series sensor when installed in S90-7R safety head.

* when the sensor is installed on the atmospheric/vent side of the rupture disk.

Sure-Saf	CSI, CSR
Sta-Saf	Sigma EXL, SK _R ⁺ , LPS, RLS, S-90, JRS, FRS
High Pressure Eco-Saf	ECR, ECV, ECT, V/ECR (see Table 4)
Nu-Saf	XN-85, XN disks in safety head types NF-7RS and NF-7R only. Also type LCN at higher pressures (see Table 1), and XN-85S and XN disks sizes 1"~3"/25mm~80mm.
High Pressure Graphite Disks	* MB, MBV, AMB, AMBV, IMB, AIMB, IMBL, AIMBL, RE, REV (see Table 4)
Other Disks	GFN, B, BV, D, DV, SVI, RB-90 – except for special reduced height safety heads that do not enclose the disk dome.

+ do not use BAS series sensor when installed in S90-7R safety head.

* when the sensor is installed on the atmospheric/ vent side of the rupture disk.

Burst Alert Sensor® Operation & Electrical Information

Each Burst Alert Sensor® is designed to operate in a “normally closed” electrical circuit. A polymer membrane is used to support an electrical conducting circuit. When the pressure event (disk rupture/valve opening) occurs, the flow of fluid places the polymer membrane in tension which leads to the break of a tantalum electrical conductor. This changes the electrical status of the sensor to “normally open.” Recommended operating limits for Burst Alert Sensors are a maximum current of 500mA, maximum voltage 24 VDC; satisfactory operation can be obtained at a few milliamperes current.

Materials

Gaskets. Compressed fiber is the standard gasket material. Optional materials such as glass filled Tef, Garlock® 3000, and Tef are available upon request. The maximum service pressure for standard compressed fiber gaskets is 1450 psig (100 barg). (1000 psig/69 barg for Garlock 3000 and 800 psig/55 barg for Tef). Tef is limited to a maximum service temperature of 200°F/93°C.

Membrane. Each Burst Alert Sensor type uses a film of polymer material to support the electrical conductor and provide electrical insulation. Either Polyimide (yellow color in photographs) or PTFE (white color in photographs) is used for this purpose.

All Burst Alert Sensors use a flattened tantalum wire as the electrical conductor. This offers optimum corrosion resistance. The user shall determine the compatibility of Burst Alert Sensor materials for each application.

Temperature Range

Burst Alert Sensors are suitable for a temperature range of: -40°F (-40°C) to 500°F (260°C); 400°F (204°C) for the LDAS family. When supplied with standard cable, the cable temperature capability is: -22°F (-30°C) to 221°F (105°C).

Optional high/low temperature cable permits use over the range from: -85°F (-65°C) to 392°F (200°C).

Sensor Cable-Optional Features

Each Burst Alert Sensor is supplied with a 3 ft./1 m length of standard cable. The following options are available:

1. Standard cable, customer selected length.
2. High/low temperature, 3 ft./1 m length attached to sensor.
3. High/low temperature, customer selected length.
4. Wipe-down “clean service” two-part cable with molded water resistant connector; 3 ft. + 9 ft. (0.9 m + 2.7 m) standard package or cut smaller (purple color).
5. Extension cables available per ft./m (WSC connector required).
6. SmartDisk™ System Connector added to the normally free end of each sensor cable.

Size Availability

Standard BAS+, DAS and BAS family sensors are available up to size 12”/300 mm. Larger sizes are available upon request. The KBA and LDAS family sensors are available up to size 8”/200 mm.



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Tagging and Packaging

Each Burst Alert Sensor is individually tagged and packaged. Burst Alert sensors are tagged indicating type, size, flange rating (where applicable), part number and traceable lot number.

Intrinsic Safety

Burst Alert Sensors are compatible with the requirements for operation of intrinsically safe electrical systems. All types of Burst Alert Sensor store no electrical energy; they are a “simple device” suitable for use in Classes I and II, Division I, Groups A through G provided that appropriate electrical apparatus is used (powered through a Zener Barrier).

Atex Compliance

Burst Alert Sensor types BAS+, ABAS+, LDAS+, DAS and ALDAS+ comply with the requirements of the European Union Atex directive. Special tagging is required and it is essential that the application service temperature is identified for each sensor order item. For further information, please consult the Burst Alert Sensor installation manual or BS&B Safety Systems.

Optional Armored Design

Sensor families BAS+, KBA, DAS and LDAS+ are available in optional armored configuration. The sensor is mounted to a stainless steel support concealed within the gaskets. This greatly increases the rigidity of the sensor for handling and installation. In addition, armored sensors have a perimeter extension tab to which the cable is tied. This isolates the “cable to sensor” connection avoiding damage should the cable be pulled hard or blown in the wind for an extended period.

Optional Connector

Each Burst Alert Sensor can be supplied with an optional weather-proof connector. The standard connector option is type WSC. The characteristics of the type WSC connector are:

- ♦ Durable threaded internal pin connections (3 pin-positive/negative/shielding)
- ♦ Durable Nylon housing, threaded assembly of housing with Nitrile O-ring seals
- ♦ 10 Amps, 250 V AC
- ♦ UL listed IP 68, EN 60529:1992 conformance.
- ♦ Cable Gland suitable for cable diameters from 3.5~5 mm
- ♦ Operating Temperature range -4°F (-20°C) to 158°F (70°C)

Alternative connectors available upon request.

Cautions:

1. The user is recommended to operate Burst Alert Sensors with a latching control and alarm system.
2. Caution when using Burst Alert Sensor technology with conducting fluids. Even though the electrical conductor path is broken, conducting liquids may enable a new electrical circuit to be completed.
3. In the event of back pressure, the operation of a Burst Alert Sensor may be influenced. Seek the advice of BS&B Safety Systems, L.L.C. or BS&B Safety Systems, Ltd.
4. When using the LDAS+ family of sensors, the user must consider the impact that accumulation of pressure upstream of the sensor will have on the set pressure of differential pressure sensitive relief devices located further upstream.

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