BDI-FLX™

BURST DISC SENSOR SYSTEM

The BDI-FLX™ Burst Disc Sensor System utilizes an electronic instrument which provides instantaneous notification of the bursting of a rupture disc using versatile interface cable options. When combined with an alarm monitor, this system provides protection for lives, equipment and the environment.

Designed for use with ASME and DIN flanges 1"-12" (25mm-300mm) or sanitary applications 1"-4" (25mm-100mm), the BDI-FLX Burst Disc Sensor System utilizes a sensor strip with a flexible potentiometer (electrical component that varies resistance in response to deflection) to signal a rupture disc has burst.

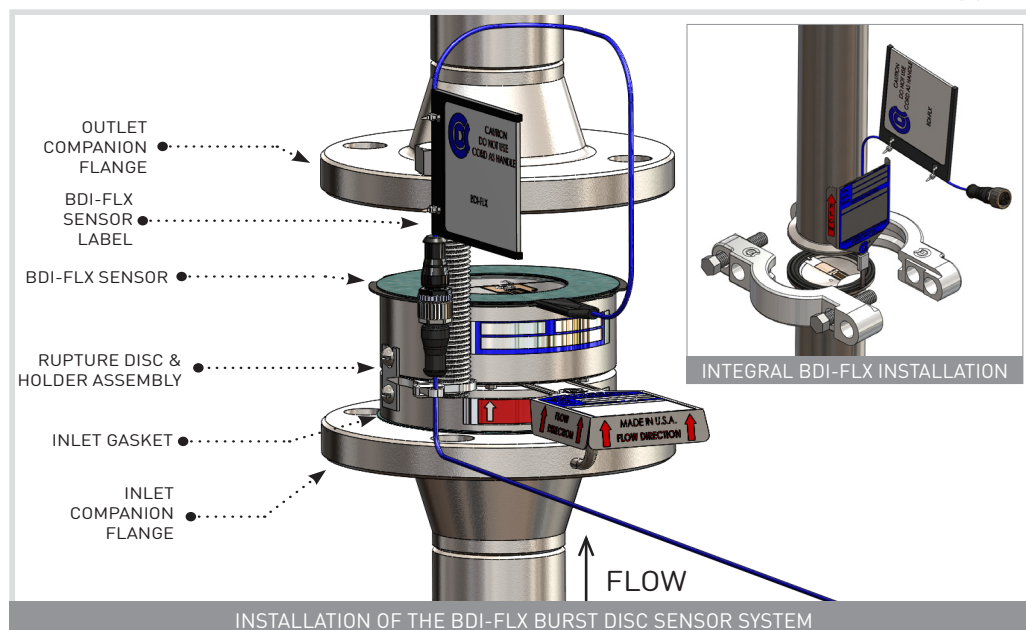## AVAILABLE FOR INDUSTRIAL AND SANITARY APPLICATIONS

BENEFITS

The BDI-FLX Burst Disc Sensor System provides many benefits, which include:

➤ **Allows direct interface to PLC's**, **DCS** (Distributed Control Systems), **alarm monitors or isolating barriers** and can provide dry contacts for industrial controls *Figure 5*

➤ **Improved durability:**

- The conductive element is fully encapsulated in corrosive resistant DuPont™ KAPTON® polyimide film
- The advanced technologies of the sensor strip minimize the risk of damage due to excessive stress beyond recommended bolting load
- The alignment ring provides a rigid support for the sensor cable, minimizing cable strain

➤ **Modernized output cable connectors** in accordance with IEC 61076-2-101. IP67 rated M12 connector.

BDI-FLX

The BDI-FLX sensor is installed at the downstream side of a rupture disc, bolted between the rupture disc holder and flange or sanitary ferrule as shown:
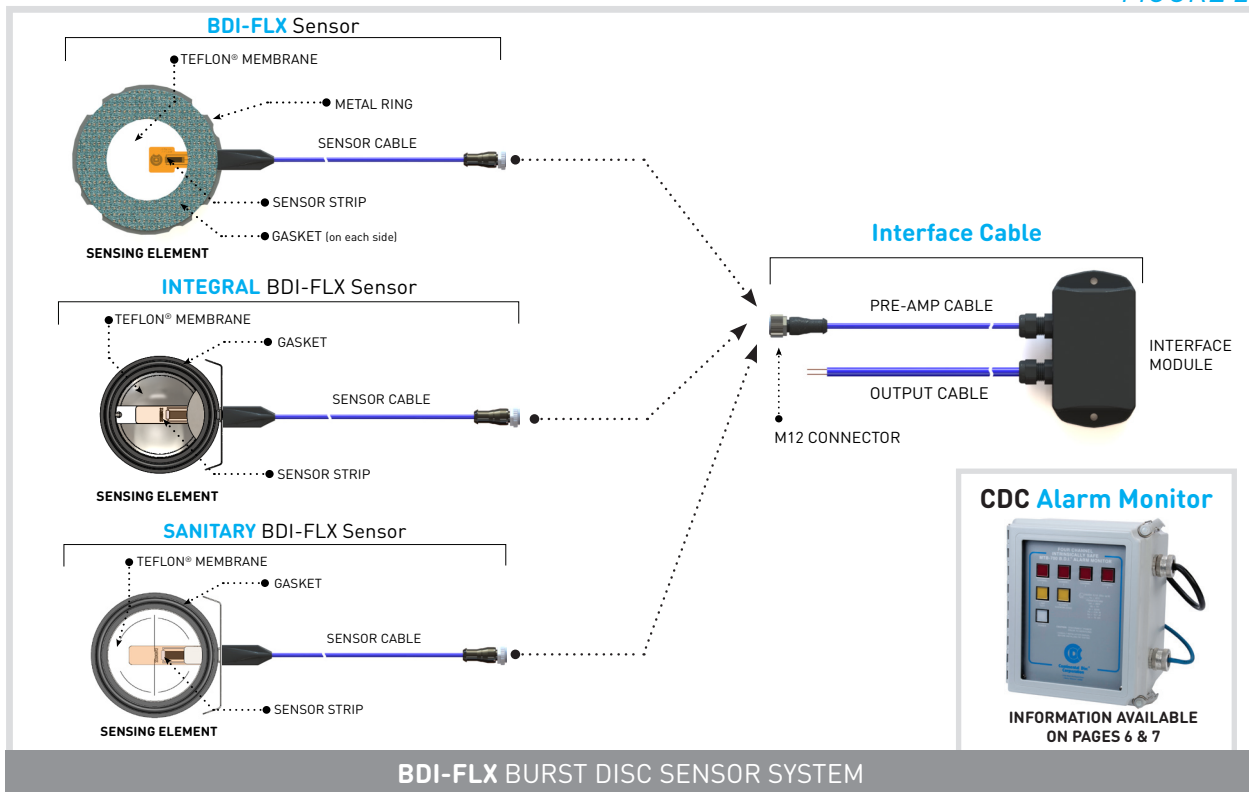
FIGURE 1

- OUTLET COMPANION FLANGE
- BDI-FLX SENSOR LABEL
- BDI-FLX SENSOR
- RUPTURE DISC & HOLDER ASSEMBLY
- INLET GASKET
- INLET COMPANION FLANGE
- FLOW
- INTEGRAL BDI-FLX INSTALLATION

INSTALLATION OF THE BDI-FLX BURST DISC SENSOR SYSTEM

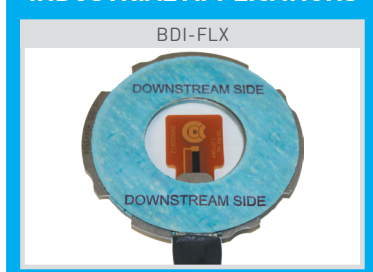## MAIN COMPONENTS OF THE BDI-FLX SENSOR SYSTEM

The BDI-FLX Burst Disc Sensor System is comprised of two main assemblies: the BDI-FLX Sensor and BDI-FLX Interface Cable as shown below:

FIGURE 2

BDI-FLX Sensor
- TEFLON® MEMBRANE
- METAL RING
- SENSOR CABLE
- SENSOR STRIP
- GASKET (on each side)
- SENSING ELEMENT

INTEGRAL BDI-FLX Sensor
- TEFLON® MEMBRANE
- GASKET
- SENSOR CABLE
- SENSOR STRIP
- SENSING ELEMENT

SANITARY BDI-FLX Sensor
- TEFLON® MEMBRANE
- GASKET
- SENSOR CABLE
- SENSOR STRIP
- SENSING ELEMENT

Interface Cable
- PRE-AMP CABLE
- OUTPUT CABLE
- INTERFACE MODULE
- M12 CONNECTOR

CDC Alarm Monitor

INFORMATION AVAILABLE ON PAGES 6 & 7

BDI-FLX BURST DISC SENSOR SYSTEM

SENSOR FEATURES

INDUSTRIAL APPLICATIONS

BDI-FLX

DOWNSTREAM SIDE
DOWNSTREAM SIDE

SANITARY APPLICATIONS

INTEGRAL BDI-FLX

SANITARY BDI-FLX

> One-time use Sensor Assembly
> Configurable for all BDI-FLX Model Interface Cable Assemblies
> Temperature: -40˚F to 400˚F (-40˚C to 204˚C)[1]
> Available for Industrial and Sanitary applications *Figures 3, 4*
> Integral for SANITRX HPX, SANITRX HPX II & SANITRX LPX (2"-3" only) Rupture Discs
> **Standard 1.5 ft (0.45 m) long, shielded blue cable with M12 connector.** The M12 connector ensures a secure connection to the interface cable. The connector can be easily disconnected and reconnected by the user for replacement of the disposable sensor. The M12 meets an IP67 rating.

SENSOR NOMINAL SIZES & ACTIVATION PRESSURES

FIGURE 3

BDI-FLX

NOMINAL SIZE		MINIMUM PRESSURE[2]	
in	mm	psig	barg
1	25	5	0,35
1 ½	40	4	0,28
2	50	3	0,21
3	80	2	0,14
4	100	2	0,14
6	150	2	0,14
8	200	2	0,14
10	250	2	0,14
12	300	2	0,14

FIGURE 4

SANITARY/INTEGRAL

NOMINAL SIZE		MINIMUM PRESSURE[2]	
in	mm	psig	barg
1	25	25	1,72
1 ½	40	10	0,69
2	50	5	0,34
3	80	2	0,14
4	100	1	0,07

[1] *Temperature limits may vary based on gasket material*
[2] *Minimum pressure is based on PSIG values. BARG values are provided for reference.*

INTERFACE CABLE FEATURES

➢ Reusable assembly
➢ Routes electric power to the sensor *Figures 2, 5*
➢ Monitors sensor strip resistance for rupture disc status
➢ Transmits output signal to user's system *Figure 5*
➢ Temperature limits: -40°F to 158°F (-40°C to 70°C)
➢ 6 ft long (1.8 m) shielded pre-amp cable with M12 connector and 6 ft long (1.8 m) shielded output cable with bare lead ends (12 ft or 3.6 m total length)

INTERFACE CABLE MODEL OPTIONS
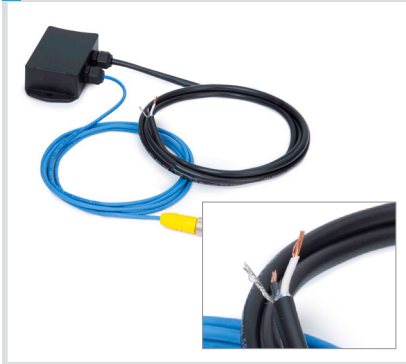
Interface Cable // Model 2W-IS

2W-IS MODEL

➢ Two-wire intrinsically safe design for use with a customer's safety barrier or the CDC MTB-700 Monitor
➢ Certified for ATEX (EU) & IECEx (International) for Zone 0 Group IIC and Zone 20, Group IIIC
➢ Certified for UL and cUL for Class I, Div 1 Group A, B, C, D; Class II, Div 1 Group F, G and Class III, Div 1

Interface Cable // Model 2W-NIS

2W-NIS MODEL

➢ Two-wire non-intrinsically safe design for use with PLC and DCS discrete input switching
➢ Powered from PLC or DCS or other suitable load that is in-series connected to DC power, no separate power input wiring is required
➢ Listed by UL and cUL under Process Control Equipment Category

Interface Cable // Model 4W-NIS

4W-NIS MODEL

➢ Four-wire non-intrinsically safe design with dry contact switching for non-classified (non-hazardous) locations
➢ Provides a "single-pole single-throw" (SPST) normally closed relay output signal
➢ Power-isolated switch output and switching capacity for DC and AC voltage
➢ Output available for PLC, DCS, interposing relays, alarm systems and actuator elements
➢ Listed by UL and cUL under Process Control Equipment Category
➢ Best suited for non-hazardous applications that require full isolation for additional safety and where users are not limited to using two-wire connection

INTERFACE CABLE SPECIFICATIONS & CERTIFICATIONS

INTERFACE CABLE SPECIFICATIONS & CERTIFICATIONS

MODEL	2W-IS	2W-NIS	4W-NIS
OPERATION	Normally Closed	Normally Closed	Normally Closed
INTRINSICALLY SAFE	ATEX II 1 GD Ex ia IIC T4 Ga Ex ia IIIC T135ºC Da	No	No
LOAD TYPE	Safety Barrier Switching Amplifier	PLC/DCS discrete input	Resistive or Inductive load, e.g., PLC/DCS, relay, etc
OPERATING VOLTAGE	6 ~ 12 VDC	7 ~ 30 VDC	6 ~ 28 VDC
OUTPUT SIGNAL TYPE	2-Wire electronic switch *(power input and signal output share the same 2-wire cable)*	2-Wire electronic switch *(power input and signal output share the same 2-wire cable)*	Reed relay *switching dry contact*
OUTPUT LEVEL SWITCHING ON	4.5 mA typical 2.5 mA MIN 4.85 mA MAX	12 mA typical 10.5 mA MIN 12.5 mA MAX	Max switching power: 3VA Max carry current: 250 mA Max switching voltage: 60 VDC or 30 VAC
OUTPUT LEVEL SWITCHING OFF	0.85 mA MAX	0.85 mA MAX	Open Contact
CE MARK	Yes (under the ATEX Directive)	Not Required	Not Required
UL / cUL MARK*	Yes Class I Div 1 A,B,C,D Groups Class II Div 1 F,G Groups Class III Div 1	Yes UL File# E350819	Yes UL File # E350819
IECEx	Ex ia IIC T4 Ga Ex ia IIIC T135°C Da	No	No
ALARM MONITOR OPTIONS			
MTB-700	Yes	No	Yes**
BB-100A	No	No	Yes**
BB-400A	No	No	Yes**

* UL and cUL marks indicate compliance with USA and Canadian product safety standards ** The BDI-FLX 4W-NIS model can work with any of our monitor models if separate input power is provided. However, the 4W-NIS is NOT for intrinsically safe applications and is not recommended for use in hazardous locations.

BOLTING CLASSES & GASKET MATERIALS/TEMPERATURES

Bolting classes for the BDI-FLX Sensor and gasket materials & temperatures for the Sanitary BDI-FLX Sensor are as follows:

BOLTING CLASSES // INDUSTRIAL APPLICATIONS

FIGURE 6

SIZE		BOLTING CLASS	
in	**mm**	ASME	DIN
1	25	150#, 300#/600#	PN 10/40
1½	40	150#, 300#/600#	PN 10/40
2	50	150#, 300#/600#	PN 10/40
3	80	150#, 300#/600#	PN 10/40
4	100	150#, 300#	PN 10/16
6	150	150#, 300#	PN 10/16
8	200	150#, 300#	PN 16
10	250	150#, 300#	PN 16
12	300	150#, 300#	PN 16

ADDITIONAL BOLTING CLASSES ARE AVAILABLE UPON REQUEST

GASKETS // INDUSTRIAL APPLICATIONS

THE BDI-FLX Sensor is available with non-asbestos or fiber reinforced fluoropolymer gaskets.
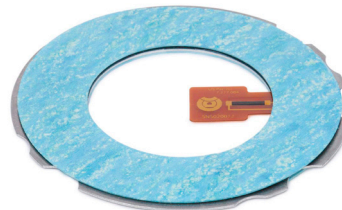
GASKET MATERIALS & TEMPS // SANITARY APPLICATIONS

FIGURE 7

FDA AND USP CLASS VI COMPLIANT GASKET MATERIALS	SERVICE TEMPERATURES			
	MINIMUM		MAXIMUM	
	°F	°C	°F	°C
Peroxide Cured Silicone	-80	-62	450	232
Platinum Cured Silicone	-80	-62	350	177
White VITON®	-20	-29	400	204
Black VITON®	-20	-29	400	204
White EPDM	-55	-48	275	135
Black EPDM	-55	-48	275	135
TEFLON® PTFE	-40	-40	450	232

Gaskets designed for use in ferrule connections having ASME-BPE dimensions or equivalent.

Gaskets for use on Sanitary BDI-FLX installations not integral to the rupture disc.

CONTINENTAL DISC ALARM MONITORS

BDI-FLX SENSOR SYSTEM, INCLUDING ALARM MONITOR

A continuous signal flows between the BDI-FLX Burst Disc Sensor System and the Alarm Monitor under normal conditions. Once the rupture disc bursts, the BDI-FLX Sensor System indicates the event, opening the electrical circuit. NOTE: If the BDI-FLX Burst Disc Sensor System loses power, it defaults to an open circuit.

Continental Disc Alarm Monitors contain replaceable modules with individual channel relays. Each channel relay connects to one BDI-FLX Sensor System. As the rupture disc bursts and the BDI-FLX Sensor System indicates the event, a specific relay is actuated, sending a signal to the control panel.

Control panels, annunciators, light panels or other signalling devices can be used to warn of a ruptured disc. The BDI-FLX Sensor System has the versatility to adapt to a variety of warning devices. The individual relay circuitry will allow the user to monitor several BDI-FLX Sensor Systems simultaneously.

Pumps, valves and other systems may also be activated to respond to an overpressure situation by the indication of a specific BDI-FLX Burst Disc Sensor System.

CONTINENTAL DISC ALARM MONITOR OPTIONS

FIGURE 8

AVAILABLE ALARM MODELS	MTB-700	BB-100A	BB-400A
DISCREET CHANNELS AVAILABLE	2 or 4	2	8
AUDIO / VISUAL ALARMS PROVIDED	Optional	NO	NO
DRY CONTACTS FOR REMOTE ALARMS	YES	YES	YES
OUTPUT RELAY TYPE	DPDT Form C	SPDT Form C	SPDT Form C
RELAY MAX CURRENT	5 A @ 240 VAC Resistive 5 A @ 24 VDC Resistive 1/8 HP @ 120/240 VAC, 7 A maximum carry current	2 A @ 120 VAC Resistive 1 A @ 120 VAC Inductive 2 A @ 24 VDC Inductive	2 A @ 120 VAC Resistive 1 A @ 120 VAC Inductive 2 A @ 24 VDC Inductive
INTRINSICALLY SAFE* FIELD CIRCUIT	YES	NO*	NO*
BARRIER TYPE	galvanically isolated	zener diode	zener diode
ENCLOSURE RATING	NEMA 4, 4X, 12, 13	NONE	NONE
OPERATING TEMPERATURE RANGE	-4°F to +113°F (-20°C to +45°C)	-40°F to +104°F (-40°C to +40°C)	-40°F to +104°F (-40°C to +40°C)
RESET MODE (LATCHING, NON-LATCHING)	latching only	either available	either available
OUTPUT CURRENT	7 VDC @ 22 MA	6 VDC @ 0.1 MA	6 VDC @ 0.1 MA
INPUT POWER OPTIONS	120/240 VAC, 50/60 Hz 24 VDC +/- 2 V	115/230 VAC 50/60 Hz 12 VDC +/- 1 V	115/230 VAC 50/60 Hz 12 VDC +/- 1 V
REMOTE MASTER TEST CONTACTS	YES	NO	NO
REMOTE MASTER RESET CONTACTS	YES	YES	YES
BARRIER CERTIFICATIONS	FM, ATEX, CSA, IECEx	None	None
BDI-FLX ALARM MONITOR OPTIONS	2W-IS	4W NIS**	4W NIS**

* *Intrinsically Safe is defined as: "Apparatus, including wiring, in which any spark or thermal effect produced either normally or in specified fault conditions...is incapable under test conditions of causing ignition of a specified mixture of flammable or combustible material in air."*

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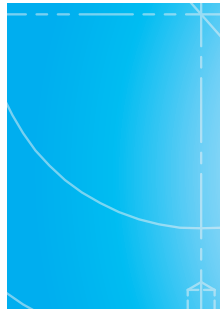
RUPTURE DISC SELECTION

All BDI-FLX™ Burst Disc Sensor System models can be used with the following rupture disc types, installed in insert type holders for 1" through 12" sizes:

HPX®   HPX-Ta®   LOTRX®   MICRO X®   COMPOSITE   STANDARD

All Sanitary and Integral BDI-FLX™ Burst Disc Sensor System models can be used with the following rupture disc types:

SANITRX HPX®   SANITRX HPX® II   SANITRX LPX™
(2"–3" only)

*FOR MORE INFORMATION ON OUR OTHER BURST DISC INDICATION PRODUCTS, PLEASE SEE THE **B.D.I.® BURST DISC INDICATOR DATASHEET.***

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