



**Continental Disc<sup>®</sup>  
Corporation**

## Preparation and Installation of the BDI-FLX<sup>®</sup> Sensor and Connection to the BDI-FLX Interface Cable

### WARNING

USER SHOULD READ AND THOROUGHLY UNDERSTAND THESE INSTRUCTIONS BEFORE INSTALLING THE RUPTURE DISC AND BDI-FLX BURST DISC SENSOR AND INTERFACE CABLE. THESE INSTRUCTIONS DO NOT PURPORT TO ADDRESS ALL OF THE SAFETY FACTORS ASSOCIATED WITH THE RUPTURE DISC'S USE IN SERVICE. IT IS THE RESPONSIBILITY OF THE USER TO ESTABLISH APPROPRIATE SAFETY, HEALTH, AND TRAINING MEASURES FOR THEIR PERSONNEL INSTALLING, SERVICING, OR WORKING IN AN AREA WHERE RUPTURE DISC ASSEMBLIES ARE IN USE. SERVICE AND/OR MAINTENANCE ON OR AROUND THE RUPTURE DISC DEVICE MUST NOT BE PERFORMED WHILE THE DEVICE IS SUBJECTED TO OPERATING PRESSURES AND/OR TEMPERATURES.

IT IS THE USER'S SOLE RESPONSIBILITY FOR DESIGN AND PLACEMENT OF RUPTURE DISCS WITHIN THEIR FACILITY AND UPON THE EQUIPMENT UPON WHICH THE RUPTURE DISC OF USER'S SELECTION IS TO BE LOCATED. IT IS USER'S SOLE RESPONSIBILITY FOR THE DESIGN OF ADEQUATE VENTING AND INSTALLATION OF ADEQUATE VENT PIPING OR DIRECTIONAL FLOW AFTER RUPTURE OCCURS WITH THE RUPTURE DISC AS INTENDED. WHEN SIZE IS SPECIFIED, CONTINENTAL DISC CORPORATION ASSUMES THAT ADEQUATE PROVISIONS HAVE BEEN MADE BY PURCHASER FOR PROPER VENTING OF A SYSTEM TO RELIEVE THE SPECIFIC PRESSURE. LOCATE RUPTURE DISC WHERE PEOPLE OR PROPERTY WILL NOT BE EXPOSED TO THE SYSTEM DISCHARGE IN CASE OF RUPTURE. VENT TOXIC OR FLAMMABLE FUMES OR LIQUIDS TO A SAFE LOCATION TO PREVENT PERSONAL INJURY OR PROPERTY DAMAGE.

IT IS THE USER'S SOLE RESPONSIBILITY TO SPECIFY THE BURST PRESSURE RATING OF A RUPTURE DISC AT A COINCIDENT TEMPERATURE AT WHICH THE RUPTURE DISC IS TO BE USED. A RUPTURE DISC IS A TEMPERATURE SENSITIVE DEVICE. THE BURST PRESSURE OF THE RUPTURE DISC IS DIRECTLY AFFECTED BY ITS EXPOSURE TO THE COINCIDENT TEMPERATURE. GENERALLY, AS THE TEMPERATURE AT THE RUPTURE DISC INCREASES, THE BURST PRESSURE DECREASES; INVERSELY, AS THE TEMPERATURE AT THE RUPTURE DISC DECREASES, THE BURST PRESSURE MAY INCREASE. FAILURE TO PROPERLY UTILIZE A RUPTURE DISC AT THE SPECIFIED COINCIDENT TEMPERATURE COULD CAUSE PREMATURE FAILURE OR OVERPRESSURIZATION OF A SYSTEM.

THE INSTANTANEOUS RELEASE OF PRESSURE FROM THE RUPTURE DISC CAN CREATE VIOLENT NOISES DUE TO THE DISCHARGE AT SONIC VELOCITY. IT IS THE USER'S SOLE RESPONSIBILITY TO PROTECT AGAINST HEARING DAMAGE TO ANY BYSTANDERS.

RUPTURE DISCS AND TAGS ARE MADE OF METAL FOILS OF VARYING THICKNESS. THE METAL EDGES MAY BE SHARP. PERSONNEL INSTALLING OR EXAMINING THE RUPTURE DISCS SHOULD PROTECT AGAINST CUTS OR INJURY WHEN HANDLING THE RUPTURE DISC. DO NOT LIFT A RUPTURE DISC BY ITS ATTACHED TAG.

PARTICLES MAY BE DISCHARGED WHEN THE RUPTURE DISC RUPTURES. THESE PARTICLES MAY BE PART OF THE RUPTURE DISC ITSELF, OR OTHER ENVIRONMENTAL MATTER IN THE SYSTEM. IT IS THE USER'S SOLE RESPONSIBILITY TO ASSURE THAT THESE PARTICLES ARE DIRECTED TO A SAFE AREA TO PREVENT PERSONAL INJURY OR PROPERTY DAMAGE.

THERE IS NO GUARANTEE OF RUPTURE DISC LIFE. SUCH LIFE SPAN IS AFFECTED BY CORROSION, CREEP AND FATIGUE, AND PHYSICAL DAMAGE. THESE CONDITIONS WILL DERATE THE RUPTURE DISC TO A LOWER SET PRESSURE. THE CUSTOMER AND/OR USER SHOULD BE PREPARED TO HANDLE PREMATURE FAILURE OF THE RUPTURE DISC. THE MEDIA OR OTHER ENVIRONMENTAL CONDITIONS SHOULD NOT ALLOW ANY BUILDUP OR SOLIDIFICATION OF MEDIA TO OCCUR ON A RUPTURE DISC. THIS MAY INCREASE THE PRESSURE SETTING OF THE RUPTURE DISC.

CUSTOMER AND/OR ITS INSTALLER SHALL BE SOLELY RESPONSIBLE FOR THE PROPER INSTALLATION OF SELLER'S HOLDERS AND RUPTURE DISCS INTO A SYSTEM. CUSTOMER AND/OR ITS INSTALLER SHALL BE SOLELY RESPONSIBLE FOR IMPROPER INSTALLATION AND PHYSICAL DAMAGE RESULTING THEREFROM, INCLUDING BUT NOT LIMITED TO, DAMAGE RESULTING FROM LEAKAGE, IMPROPER TORQUING OR SEATING OF A RUPTURE DISC OR FAILURE TO FOLLOW INSTALLATION INSTRUCTIONS WHERE PROVIDED.

RUPTURE DISCS ARE PRECISION SAFETY DEVICES AND MUST BE INSTALLED PROPERLY. RUPTURE DISCS MUST BE INSTALLED BY TRAINED, KNOWLEDGEABLE INSTALLERS AND ONLY WITHIN ENVIRONMENTS SUITABLE AND APPROPRIATE FOR A RUPTURE DISC. CARE MUST BE USED IN A FACILITY'S DESIGN TO PROTECT BOTH THE RUPTURE DISC FROM INADVERTENT DAMAGE WHICH COULD CAUSE ITS PREMATURE RELEASE AND TO PROTECT INDIVIDUALS EXPOSED TO HAZARDS CREATED BY SUCH SUDDEN RELEASE.

PROPER INSTALLATION OF A RUPTURE DISC IS CRITICAL TO PERFORMANCE AND TO SAFETY. FAILURE TO PROVIDE PROPER SEATING OF A RUPTURE DISC MAY AFFECT RUPTURE DISC PERFORMANCE, BURST PRESSURE ACCURACY AND MAY RESULT IN ITS PREMATURE FAILURE.

## I. Safety Precautions Before Installation

- WARNING: FOR FULL LIQUID APPLICATIONS: THE BDI-FLX SENSOR REQUIRES DYNAMIC MOVEMENT TO SIGNAL. SLOW REVERSAL OF THE RUPTURE DISC, SUCH AS WITH LIQUID THERMAL EXPANSION, MAY NOT CAUSE THE BDI-FLX SENSOR TO INDICATE. A SMALL CRACK IN A RUPTURE DISC SCORE MAY NOT CAUSE THE BDI-FLX SENSOR TO INDICATE. NOTE THAT THE BDI-FLX SENSOR IS DESIGNED TO INDICATE WITHIN A FEW MILLISECONDS, SO FULL REVERSAL AND FULL OPENING OF THE RUPTURE DISC MUST OCCUR WITHIN A FEW MILLISECONDS. IF FULL LIQUID FLOW AT SET PRESSURE OR A GAS HEAD WILL NOT BE PRESENT DURING RUPTURE OF DISC, CONTACT CDC FOR EVALUATION.**
- THE BDI-FLX SENSOR IS A PRECISION ELECTRICAL SENSOR. EVERY EFFORT SHOULD BE MADE NOT TO PRESS, FOLD, WRINKLE, TWIST, OR DO ANYTHING TO THE SENSOR THAT MIGHT DAMAGE IT.**
- THE BDI-FLX SENSOR IS DESIGNED TO OPERATE ONLY IN CONJUNCTION WITH THE BDI-FLX INTERFACE CABLE. DO NOT TRY TO OPERATE THE SENSOR WITHOUT THE BDI-FLX INTERFACE CABLE. VERIFY THAT THE SENSOR MODEL MATCHES THE INTERFACE CABLE MODEL.**
- See rupture disc tag to verify set pressure, operating temperature, and all other operating parameters.

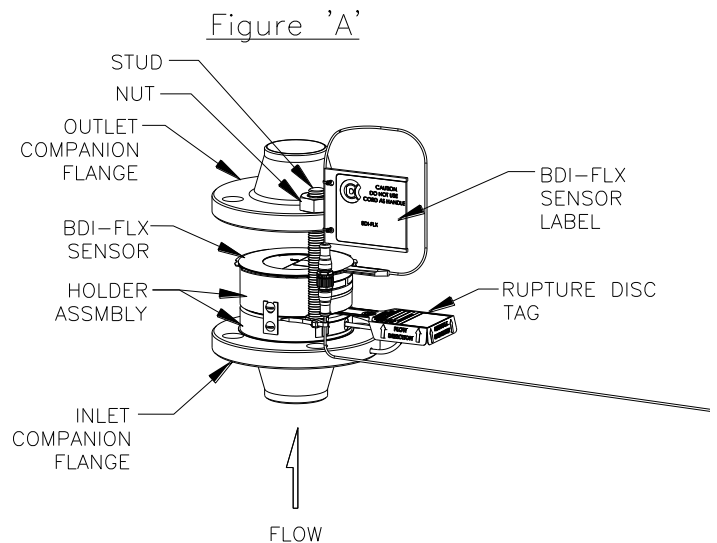
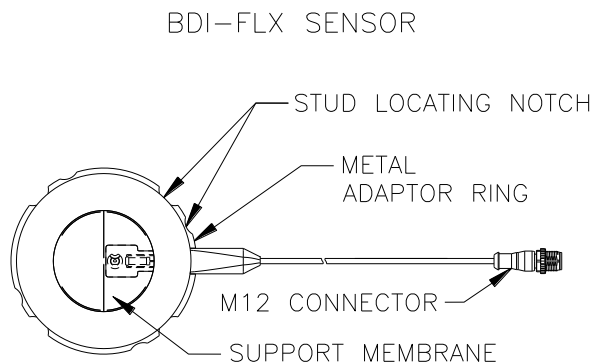
## II. Preparation of Rupture Disc Holder Outlet and Outlet Companion Flange for Installation

Clean all foreign material from the contact surfaces of both the rupture disc holder outlet and the outlet companion flange. These surfaces must be completely clean and free of all rust, corrosion, and foreign material to ensure a proper seal. Use of solvents, steel wool, or fine emery cloth is permissible. Do not re-machine. Do not use scraper or abrasives.

## III. Installation of the BDI-FLX Sensor (See Figure A)

- Minimum burst pressure based on full area relief devices of the same nominal pipe size.

BDI-FLX Standard Offer	
Size Inches (mm)	Burst Pressure psig / (barg)
1 / (25)	5 / (0.34)
1-1/2 (40)	4 / (0.28)
2 / (50)	3 / (0.21)
3 & up / (80 & up)	2 / (0.14)



**NOTE: DO NOT INSTALL THE BDI-FLX SENSOR ON DEVICES WITH MINIMUM BURST PRESSURE RATINGS BELOW THOSE LISTED ABOVE. THE MINIMUM BURST PRESSURE RATING OF A DEVICE THAT THE SENSOR CAN BE INSTALLED WITH IS PRINTED ON THE LABEL ATTACHED TO THE SENSOR.**

- Assemble rupture disc and rupture disc holder as a unit per the applicable rupture disc installation instruction.
- Visually inspect the thin support membrane of the BDI-FLX sensor. The membrane is designed with a partially slit pattern. **DO NOT INSTALL THE SENSOR** if the membrane is broken at the center or edge, detached from the sensor, folded, wrinkled, or twisted.
- Place the BDI-FLX sensor with the side marked **"DOWNSTREAM SIDE"** facing up (downstream) on top of the rupture disc holder outlet.

- Use care in keeping the BDI-FLX sensor and the holder outlet concentrically aligned. The BDI-FLX sensor contains a metal ring with stud locating notches on the external diameter to help align the sensor and install the studs without interference. **Table 1** provides the applicable bolting class for BDI-FLX Sensor standard offer.

Table 1: APPLICABLE BOLTING CLASS FOR BDI-FLX Sensor

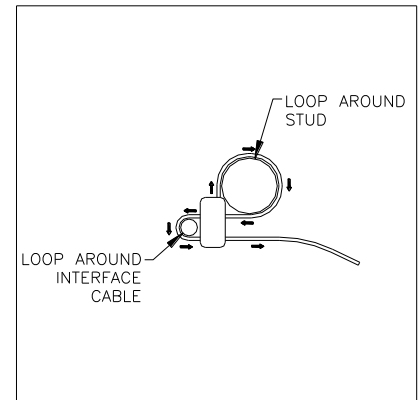
Size Inches / (mm)	ASME Bolting	DIN Bolting
1 / (25)	150, 300/600#	PN 10/40
1-1/2 / (40)	150, 300/600#	PN 10/40
2 / (50)	150, 300/600#	PN 10/40
3 / (80)	150, 300/600#	PN 10/40
4 / (100)	150, 300#	PN 10/16
6 / (150)	150, 300#	PN 10/16
8 / (200)	150, 300#	PN 16
10 / (250)	150, 300#	PN 16
12 / (300)	150, 300#	PN 16

**NOTE: DEPENDING ON THE SPECIFIC RUPTURE DISC HOLDER DESIGN / DIMENSIONS, THE DOME OF THE RUPTURE DISC MAY PROTRUDE BEYOND THE HOLDER OUTLET, CONTACTING THE BDI-FLX SENSOR SUPPORT MEMBRANE. CARE MUST BE TAKEN WHEN PLACING THE SENSOR ON THE RUPTURE DISC OUTLET HOLDER SUCH THAT THE SUPPORT MEMBRANE IS NOT TIGHT AGAINST THE RUPTURE DISC DOME. IF THIS OCCURS, IT COULD AFFECT THE PERFORMANCE OF THE RUPTURE DISC OR CAUSE THE SENSOR TO PROVIDE AN INACCURATE OUTPUT SIGNAL. REFERENCE TABLE 2 FOR THE MAXIMUM HEIGHT THE RUPTURE DISC CAN PROTRUDE PAST THE HOLDER OUTLET. IF THE RUPTURE DISC PROTRUDES BEYOND THE ALLOWABLE HEIGHT OUTLINED IN THE TABLE, CONTACT CONTINENTAL DISC CORPORATION FOR ASSISTANCE.**

Table 2: Maximum Height Rupture Disc Can Protrude Past the Holder Outlet

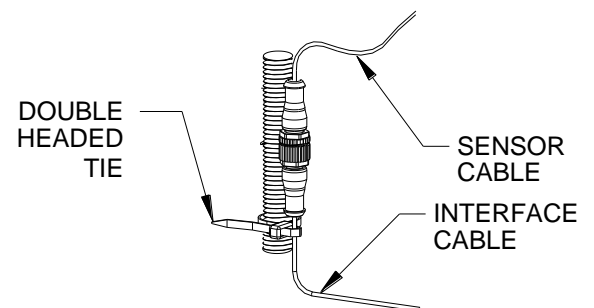
Size Inches / (mm)	Height Inches / (mm)
1 / (25)	0 / (0)
1-1/2 / (40)	0 / (0)
2 / (50)	0 / (0)
3 / (80)	0 / (0)
4 / (100)	0 / (0)
6 / (150)	0 / (0)
8 / (200)	0.4 (10)
10 / (250)	0.6 (15)
12 / (300)	0.8 (20)

Figure 'B-1'



- Place the entire unit on top of the inlet companion flange.
- Lower the outlet companion flange carefully onto the BDI-FLX sensor.
- The BDI-FLX sensor is provided with a double headed tie. Create double loop as shown in **Figure B-1** illustration. Slip the tie over one companion flange stud as shown (see **Figure B-2**), locating it near where the sensor exits. Snug the tie around the stud and the interface cable as shown in **Figure B-2**.
- Install the remaining studs and nuts in accordance with the rupture disc installation instruction. Do not exceed the maximum torque values listed in **Table 3** for the specific size and class of flange.

Figure 'B-2'



**NOTE: EXCEEDING THE MAXIMUM TORQUE VALUES IN TABLE 3 COULD DAMAGE THE SENSOR.**

- If the BDI-FLX sensor is installed directly between flanges, install lightly oiled, free running studs and nuts to finger tightness. Using a cross torquing pattern (see **Figure C**), torque each nut with a calibrated torque wrench at 20% increments of recommended torque value (see **Table 3**). Repeat 20% increments and cross-torquing pattern until final torque value is achieved. Recheck all nuts in rotational sequence at final torque value. These values are based on using stud and nut material per ASME SA193-B7 and SA194-2H respectively, with a stress of up to 30,000 psi. The use of studs and nuts with lower strength may prove unsatisfactory.

#### IV. Connecting the BDI-FLX Sensor and BDI-FLX Interface Cable

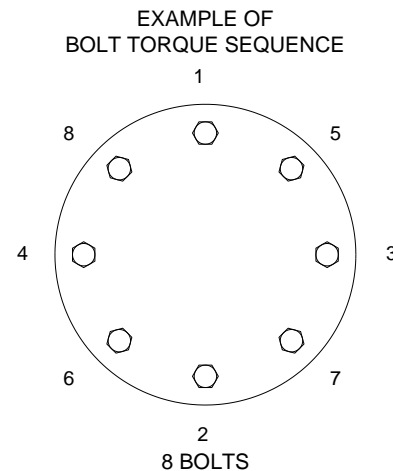
**WARNING: CONNECTING THE SENSOR AND INTERFACE CABLE SHOULD ONLY BE PERFORMED BY QUALIFIED PERSONNEL FOLLOWING THE LATEST EDITION OF THE GOVERNING ELECTRICAL CODE.**

- User should read carefully and understand the BDI-FLX Sensor System Operator's Manual before connecting the sensor and interface cable.
- Verify that you are utilizing the correct BDI-FLX Interface Cable model for your installation:

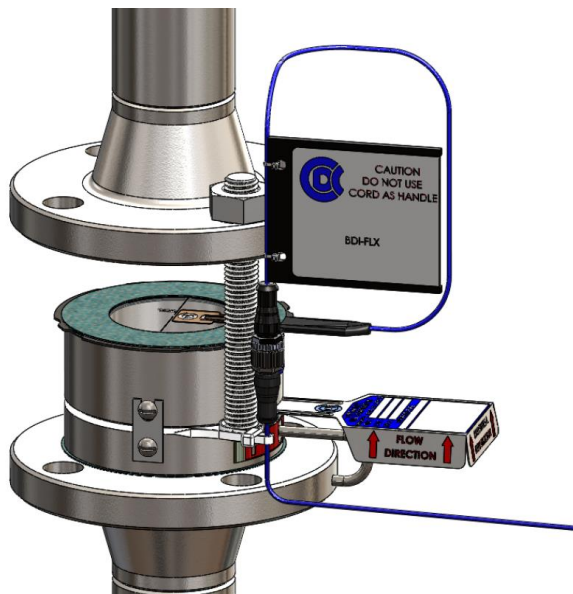
Model 2W-IS: Two-Wire Output – Intrinsically Safe Design  
Model 2W-NIS: Two-Wire Output – Non Intrinsically Safe Design  
Model 4W-NIS: Four-Wire Output – Non Intrinsically Safe Design

- Verify that power is off or the interface cable is not connected to a power supply.
- Plug the BDI-FLX sensor M12 male connector into the corresponding BDI-FLX interface cable female connector and thread the screw ring to lock the connection (see **Figure D**).

**Figure 'C'**



**Figure 'D'**



**NOTE: POWER MUST BE OFF OR DISCONNECTED FROM THE INTERFACE CABLE BEFORE CONNECTING THE SENSOR. FAILURE TO DO SO WILL RESULT IN A FALSE SIGNAL.**

## V. Preventative Maintenance

1. Verify that the power is off and/or the interface cable is not connected to the power supply before disconnecting the sensor and interface cable for inspection or replacement.
2. Risk assessment and an annual rupture disc and BDI-FLX sensor replacement are recommended. Rupture disc service life is determined by system operating conditions. The effects of severe pressure/vacuum cycles, corrosion, temperature variations, or other adverse conditions must be evaluated by the user through actual service experience to determine optimal service life.
3. **IF THE RUPTURE DISC AND BDI-FLX SENSOR ARE NOT REPLACED PERIODICALLY WHEN EXPOSED TO THESE CONDITIONS, PREMATURE FAILURE OF THE RUPTURE DISC (THEREBY DISCHARGING THE PROCESS MEDIA) OR A FALSE SIGNAL OF THE SENSOR MAY OCCUR.**
4. To avoid extended downtime, maintain three spare rupture discs and BDI-FLX sensors in stock at all times for each holder in use. The number of spares required ultimately will be determined by service conditions.

## VI. Customer Service

If you wish to discuss your application, installation, or maintenance, please contact the Customer Service Department at our headquarters location.

### BDI-FLX SENSOR OPERATING DATA:

TEMPERATURE LIMITS: -40 °F to + 400 °F (-40 °C to + 204 °C)

CONNECTOR RATING: IP67

### CERTIFICATES:

ATEX EC-TYPE Examination Certificate No: ITS11ATEX27435X

IECEX Certificate of Conformity No: IECEXITS11.0050X

UL/cUL Certificate of Compliance No: 20121109-E347849

### SPECIAL CONDITIONS FOR SAFE USE

When located in a Zone 0 hazardous area, the user shall ensure that electrostatic charging of the interface enclosure cannot occur.

When located in Zone 1 or Zone 2, the interface enclosure represents an electrostatic hazard and the enclosure shall only be cleaned using a damp cloth. Solvents shall not be used.

**TABLE 3**

**Maximum Recommended Torque Values for the BDI-FLX Sensor**

**Sizes 1" Through 12"**

SIZE		COMPANION FLANGE RATING		RECOMMENDED TORQUE VALUE		SIZE		COMPANION FLANGE RATING		RECOMMENDED TORQUE VALUE	
IN	MM	ASME	DIN	FT•LB	N•m	IN	MM	ASME	DIN	FT•LB	N•m
1	25	150	---	35	47	4	100	150	---	65	88
1	25	---	10/16	33	45	4	100	---	10/16	66	89
1	25	300/600	---	65	88	4	100	300	---	120	163
1	25	---	25/40	49	66						
						6	150	150	---	120	163
1-1/2	40	150	---	35	47	6	150	---	10/16	126	171
1-1/2	40	---	10/16	44	60	6	150	300	---	120	163
1-1/2	40	300/600	---	120	163						
1-1/2	40	---	25/40	101	137						
						8	200	150	---	130	176
						8	200	---	16	91	123
2	50	150	---	65	88	8	200	300	---	180	244
2	50	---	10/16	66	89						
2	50	300/600	---	65	88	10	250	150	---	185	251
2	50	---	25/40	131	178	10	250	---	16	200	271
						10	250	300	---	275	373
3	80	150	---	65	88						
3	80	---	10/16	33	45	12	300	150	---	185	251
3	80	300/600	---	120	163	12	300	---	16	200	271
3	80	---	25/40	101	137	12	300	300	---	375	508



**Continental Disc®  
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