



BDI-FLX™ 2W-IS Burst Disc Sensor System Manual Supplement UL C/US Intrinsic Safety Control Drawing

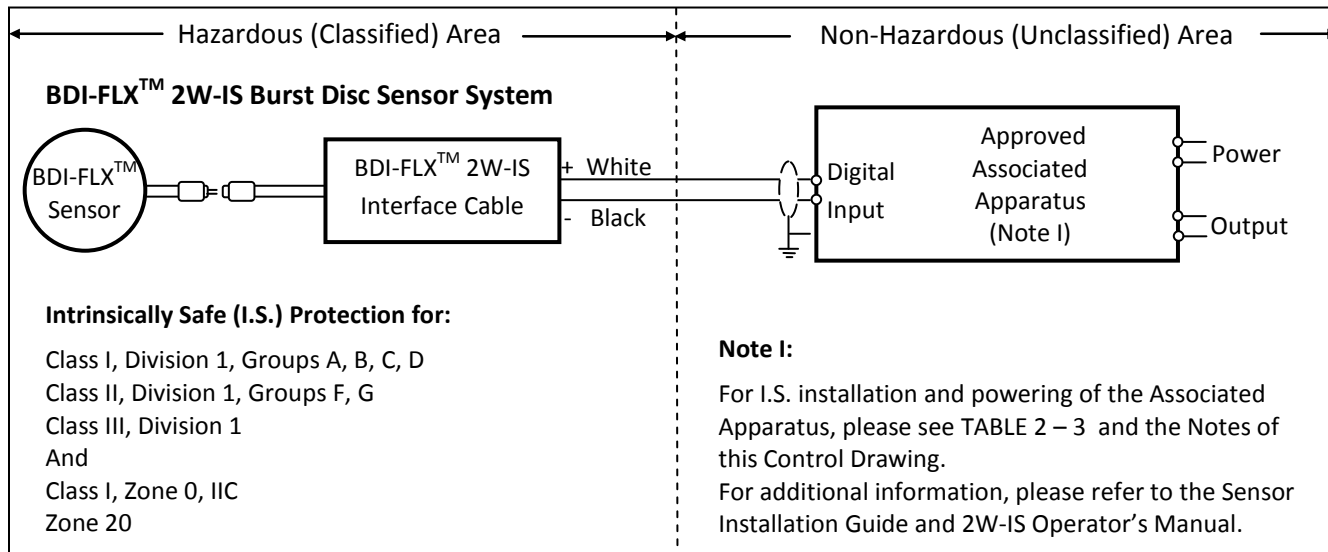


TABLE 1 Burst Sensor
I.S. Entity Parameters:

V_{max} (or U_i) = 12 Vdc
 I_{max} (or I_i) = 60 mA
 P_{max} (or P_i) = 180 mW
 C_i = 0
 L_i = 0

TABLE 2 2W-IS Interface Cable
I.S. Entity Parameters:

V_{max} (or U_i) = 12 Vdc
 I_{max} (or I_i) = 60 mA
 P_{max} (or P_i) = 180 mW
 C_i = 1.112 μ F
 L_i = 0

TABLE 3 Associated Apparatus Output Parameters:

V_{oc} or V_t (or U_o) $\leq V_{max}$ (or U_i) = 12 Vdc
 I_{sc} or I_t (or I_o) $\leq I_{max}$ (or I_i) = 60 mA
 P_o $\leq P_{max}$ (or P_i) = 180 mW
 C_a (or C_o) $\geq C_i + C_{cable}$ = 1.112 + C_{cable} μ F
 L_a (or L_o) $\geq L_i + L_{cable}$ = L_{cable} μ H
 If P_o of the associated apparatus is not known, it may be calculated using the formula: $P_o = (V_{oc} \times I_{sc})/4 = (U_o \times I_o)/4$

Notes:

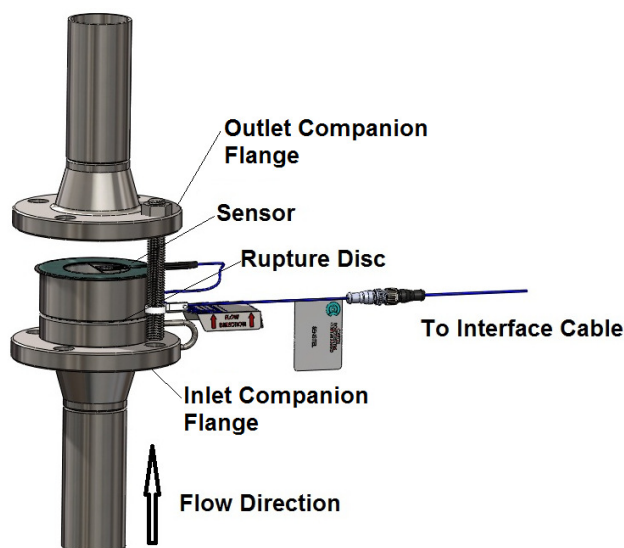
1. No revision change to this drawing is allowed without prior UL Approval.
2. Selected Associated Apparatus must be third party listed as providing intrinsically safe circuits for the applied hazardous location, and must have its entity parameters conforming to Table 3.
3. The Burst Sensor and the 2W-IS Interface Cable are both designed and certified as Intrinsically Safe (I.S.) devices that can be used in the listed hazardous locations. The Burst Sensor can only be connected through the Interface Cable to function properly. The Burst Sensor is not to be connected to an associated apparatus or safety barrier for safety nor for functionality.
4. Associated apparatus must be installed in accordance with its manufacturer's control drawing and Article 504 (Division System) or 505 & 506 (Zone System) of the National Electrical Code (ANSI/NFPA 70) for installation in the United States, or Section 18 of the Canadian Electrical Code for installation in Canada, and Instrument Society of America Recommended Practice ISA RP 12.6 for installing intrinsically safe equipment.
5. Associated apparatus shall not be connected to a power supply or any other device that uses or generates in excess of 250V rms or dc with respect to earth unless it has been determined that the voltage is adequately isolated from the associated apparatus.
6. When required by the manufacturer's control drawing, the associated apparatus must be connected to a suitable ground electrode per National Electrical Code, Canadian Electrical Code or other local installation codes, as applicable. The resistance between Intrinsically Safe Ground and Earth Ground must be less than 1.0 Ohm.
7. Associated apparatus must not be used in combination unless permitted by the associated apparatus certification.
8. Associated apparatus may be in a Division 2 or Zone 2 locations if so approved.

9. Each Burst Disc Sensor System shall be wired as separate intrinsically safe circuit. To maintain intrinsic safety, wiring associated with each Sensor System must be run in separate cables or separate shields connected to Associated Apparatus intrinsically safe ground. Refer to ISA RP 12.6.
10. The capacitance and inductance of the wiring shall be calculated and must be included in the system calculations as shown in Table 2 and 3. The maximum allowed cable length is calculated by using Table 2, such that the cable capacitance, C_{cable} , plus BDI-FLX 2W-IS capacitance, C_i ($=1.112 \mu\text{F}$), must be less than the associated apparatus marked output capacitance, C_a (or C_o). The same applied for inductance. When the cable capacitance and inductance per foot are not known, the following values shall be used: $C_{\text{cable}} = 60 \text{ pF/ft}$, $L_{\text{cable}} = 0.2 \mu\text{H/ft}$.
11. A schematic representation of the installation, assembling and dismantling of the Burst Disc Sensor can be found in Figure A.
12. **WARNING - SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY. ENCLOSURE IS FACTORY SEALED. DO NOT OPEN.**

Avertissement - Le remplacement de composants peut compromettre la sécurité intrinsèque. Le boîtier est scellé en usine. Ne pas ouvrir.
13. **WARNING - TO PREVENT IGNITION OF FLAMMABLE OR COMBUSTIBLE ATMOSPHERES, DISCONNECT POWER BEFORE SERVICING.**

Avertissement - Pour éviter tout départ de feu en atmosphère inflammable ou en présence de combustible, couper l'alimentation avant toute intervention d'entretien.

Figure A Installation of BDI-FLX Sensor



To assemble:

Insert the sensor between the piping companion flanges or ferrules with the sensor on the downstream side of the rupture disc. Assemble the companion flanges or ferrules with studs and nuts or clamps. After the sensor is inserted and clamped in position, connect the sensor cable connector to the 2W-IS interface cable.

To disassemble:

Disconnect the sensor connector from the interface cable. Disassemble the studs and nuts or clamps from the companion flanges or ferrules. Take out the sensor and/or rupture disc for inspection or replacement.

Note:

1. Ensure power supply is disconnected before assembling and disassembling.
2. For complete installation instructions refer to BDI-FLX Sensor Installation Manual and 2W-IS Interface Cable Operator's Manual.

14. In installations where the process temperature exceeds 125°C it must be ensured that the surface temperature of the parts of sensor and interface cable assembly exposed to the hazardous atmosphere do not exceed the auto-ignition temperature of the surrounding atmosphere.

15. 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.

16. The BDI-FLX 2W-IS Interface Cable Assembly and Burst Disc Sensor were evaluated in accordance with the following:

- UL 913, 7th Ed., Rev. 2011-09-23
- UL 60079-0, 5th Ed., Rev. 2009-11-21
- UL 60079-11, 5th Ed., Rev. 2011-05-05
- ANSI/ISA 61241-0, Rev. 2006-06-13
- ANSI/ISA 61241-11, Rev. 2011-03-29
- CAN/CSA C22.2 No. 60079-0:11, Rev. 2011-12
- CAN/CSA C22.2 No. 60079-11:11, Rev. 2011-12
- CAN/CSA C22.2 No. 157-92, Rev. 2003-06

APPROVALS:

Interface Cable Assembly

UL: I.S. for Cl I, II, III, Div 1, Gp A, B, C, D, F, G
Cl I, Zone 0, AEx ia IIC T4
Zone 20, AEx iaD T135°C

cUL: I.S. for Cl I, II, III, Div 1, Gp A, B, C, D, F, G
Cl I, Zone 0, Ex ia IIC T4

Burst Disc Sensor

UL: I.S. for Cl I, II, III, Div 1, Gp A, B, C, D, F, G
Cl I, Zone 0, AEx ia IIC T*
Zone 20, AEx iaD T**

cUL: I.S. for Cl I, II, III, Div 1, Gp A, B, C, D, F, G
Cl I, Zone 0, Ex ia IIC T*

Temperature Codes for Burst Disc Sensor (Zone 0):
T*=T6: $-40^{\circ}\text{C} \leq T_{\text{process}} \leq 75^{\circ}\text{C}$ & $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq 40^{\circ}\text{C}$
T*=T4: $-40^{\circ}\text{C} \leq T_{\text{process}} \leq 125^{\circ}\text{C}$ & $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq 75^{\circ}\text{C}$
For ambient or process temperatures exceeding the above ranges, please see note 14.

Temperature Marking for Burst Disc Sensor (Zone 20):
T**=T85°C: $-40^{\circ}\text{C} \leq T_{\text{process}} \leq 75^{\circ}\text{C}$ & $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq 40^{\circ}\text{C}$
T**=T135°C: $-40^{\circ}\text{C} \leq T_{\text{process}} \leq 125^{\circ}\text{C}$ & $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq 75^{\circ}\text{C}$
For ambient or process temperatures exceeding the above ranges, please see note 14.



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