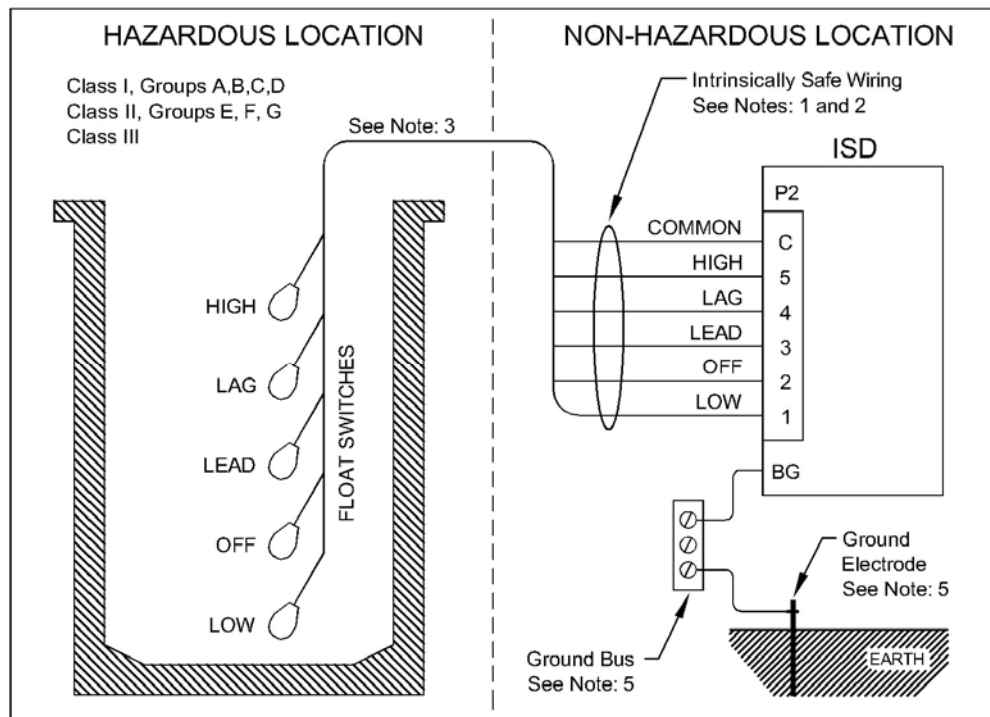


# INTRINSICALLY SAFE DUPLEXER    ISD

Control Drawing No. 0302 Page 1 of 3

FLOAT SWITCH APPLICATION



Notes for Control Drawing 0302 Page 1 of 3:

1. All intrinsically safe wiring shall be separated from non-intrinsically safe wiring. Refer to article 504.2 of the National Electric Code (ANSI/NFPA 70) or other local codes, as applicable.
2. Maximum distance between ISD and Float Switches is 1000 feet.
3. The Float Switches used with the ISD shall be any non-energy storing or generating switch type device containing no capacitance or inductance. The Float Switch's cable capacitance plus it's equipment capacitance ( $C_i$ ) must be less than the capacitance ( $C_a$ ) marked on the ISD. Also, the Float Switch's cable inductance plus its equipment Inductance ( $L_i$ ) must be less than the inductance ( $L_a$ ) marked on the ISD. If the electrical parameters of the cable are unknown, then a capacitance value of 60 pF/ft – and an inductance of 0.20  $\mu$ H/ft are to be used. Cable capacitance and cable inductance are calculated as follows: 60 pF/ft x 1000 ft = 60 nF 0.2  $\mu$ H/ft x 1000 ft = 0.20 mH
4. The ISD must be installed in an enclosure suitable for the application in accordance with the National Electric Code (ANSI/NFPA 70) for installation in the United States, the Canadian Electrical Code for installations in Canada, or other local codes, as applicable.
5. The ISD barrier ground must be connected to the ground bus in the power distribution panel. The ground bus must be connected to a suitable ground electrode per the National Electric Code (ANSI/NFPA 70) or other local codes, as applicable. The resistance of the ground path from the ISD barrier ground to the ground electrode must be less than 1 Ohm.
6. The ISD must not be connected to devices that use or generate more than 250 Vrms or dc with respect to earth.
7. This associated apparatus (ISD) has not been evaluated for use in combination with another associated apparatus.
8. A. For installations in which both the  $C_i$  and  $L_i$  of the intrinsically safe apparatus exceeds 1% of the  $C_o$  and  $L_o$  parameters of the associated apparatus (excluding the cable), then 50% of  $C_o$  and  $L_o$  parameters are applicable and shall not be exceeded.  
B. The output current of this associated apparatus is limited by a resistor such that the output voltage-current plot is a straight line drawn between open-circuit voltage and short-circuit current.

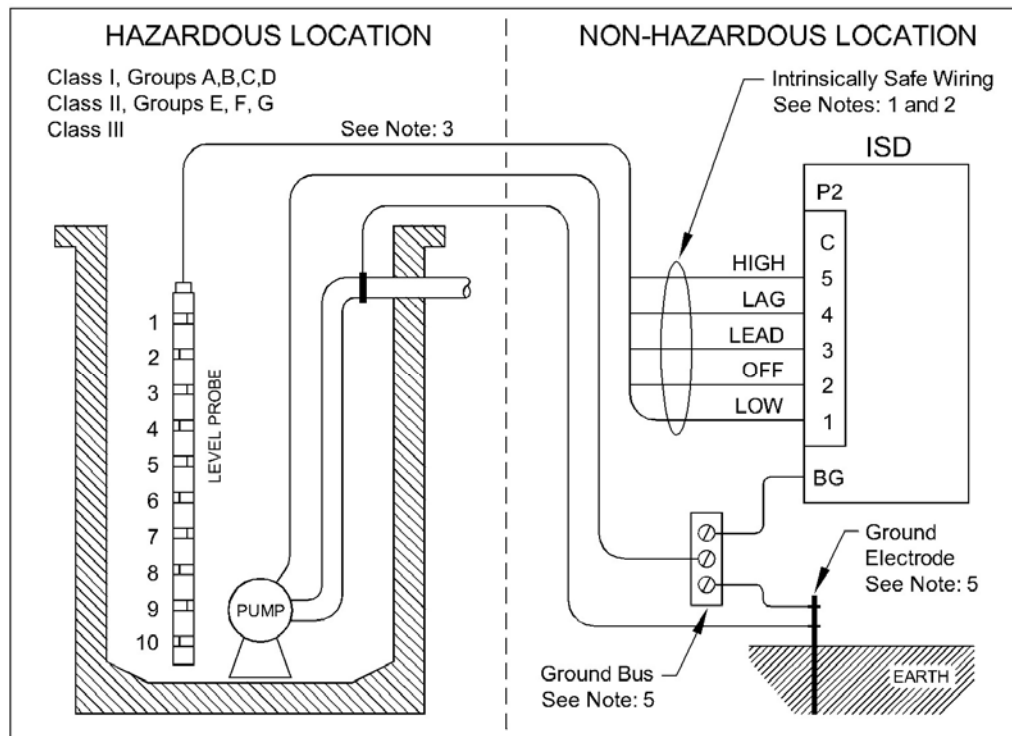
ISD Entity Parameters:  $V_t = 27.6\text{ V}$   $I_t = 40.5\text{ mA}$   $C_a = 86\text{ nF}$   $L_a = 216.7\text{ uH}$   $P_o = 279\text{ mW}$   $U_m = 250\text{ Vrms}$

Revision Date: 9-23-10

# INTRINSICALLY SAFE DUPLEXER ISD

Control Drawing No. 0302 Page 2 of 3

GROUNDING TANK APPLICATION



Notes for Control Drawing 0302 Page 2 of 3:

1. All intrinsically safe wiring shall be separated from non-intrinsically safe wiring. Refer to article 504.2 of the National Electric Code (ANSI/NFPA 70) or other local codes, as applicable.
2. Maximum distance between ISD and Probe is 1000 feet.
3. The Probe's cable capacitance plus the Probe's intrinsically safe equipment capacitance ( $C_i$ ) must be less than the capacitance ( $C_a$ ) marked on the ISD. Also, the Probe's cable inductance plus the Probe's intrinsically safe equipment Inductance ( $L_i$ ) must be less than the inductance ( $L_a$ ) marked on the ISD. If the electrical parameters of the cable are unknown, then a capacitance value of 60 pF/ft – and an inductance of 0.20  $\mu$ H/ft are to be used. Cable capacitance and cable inductance are calculated as follows:  $60 \text{ pF/ft} \times 1000 \text{ ft} = 60 \text{ nF}$   
 $0.2 \mu\text{H/ft} \times 1000 \text{ ft} = 0.20 \text{ mH}$
4. The ISD must be installed in an enclosure suitable for the application in accordance with the National Electric Code (ANSI/NFPA 70) for installation in the United States, the Canadian Electrical Code for installations in Canada, or other local codes, as applicable.
5. The hazardous location ground and the ISD barrier ground must be connected to the ground bus in the power distribution panel. The ground bus must be connected to a suitable ground electrode per the National Electric Code (ANSI/NFPA 70) or other local codes, as applicable. The resistance of the ground path from the ISD barrier ground to the ground electrode must be less than 1 Ohm.
6. The ISD must not be connected to devices that use or generate more than 250 Vrms or dc with respect to earth.
7. This associated apparatus (ISD) has not been evaluated for use in combination with another associated apparatus.
8. A. For installations in which both the  $C_i$  and  $L_i$  of the intrinsically safe apparatus exceeds 1% of the  $C_o$  and  $L_o$  parameters of the associated apparatus (excluding the cable), then 50% of  $C_o$  and  $L_o$  parameters are applicable and shall not be exceeded.  
B. The output current of this associated apparatus is limited by a resistor such that the output voltage-current plot is a straight line drawn between open-circuit voltage and short-circuit current.

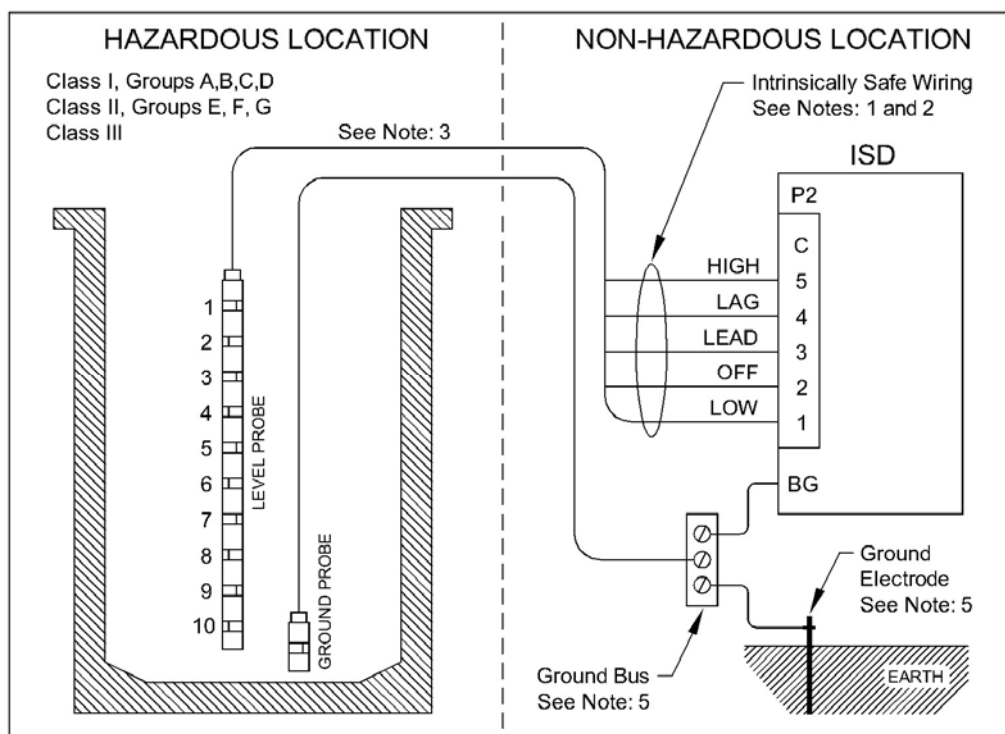
ISD Entity Parameters:  $V_t = 27.6 \text{ V}$   $I_t = 40.5 \text{ mA}$   $C_a = 86 \text{ nF}$   $L_a = 216.7 \mu\text{H}$   $P_o = 279 \text{ mW}$   $U_m = 250 \text{ Vrms}$

Revision Date: 9-23-10

# INTRINSICALLY SAFE DUPLEXER    ISD

Control Drawing No. 0302    Page 3 of 3

UNGROUND TANK APPLICATION



Notes for Control Drawing 0302 Page 3 of 3:

1. All intrinsically safe wiring shall be separated from non-intrinsically safe wiring. Refer to article 504.2 of the National Electric Code (ANSI/NFPA 70) or other local codes, as applicable.
2. Maximum distance between ISD and Probe is 1000 feet.
3. The Probe's cable capacitance plus the Probe's intrinsically safe equipment capacitance ( $C_i$ ) must be less than the capacitance ( $C_a$ ) marked on the ISD. Also, the Probe's cable inductance plus the Probe's intrinsically safe equipment Inductance ( $L_i$ ) must be less than the inductance ( $L_a$ ) marked on the ISD. If the electrical parameters of the cable are unknown, then a capacitance value of 60 pF/ft – and an inductance of 0.20  $\mu$ H/ft are to be used. Cable capacitance and cable inductance are calculated as follows:  $60 \text{ pF/ft} \times 1000 \text{ ft} = 60 \text{ nF}$   
 $0.2 \mu\text{H/ft} \times 1000 \text{ ft} = 0.20 \text{ mH}$
4. The ISD must be installed in an enclosure suitable for the application in accordance with the National Electric Code (ANSI/NFPA 70) for installation in the United States, the Canadian Electrical Code for installations in Canada, or other local codes, as applicable.
5. The hazardous location ground and the ISD barrier ground must be connected to the ground bus in the power distribution panel. The ground bus must be connected to a suitable ground electrode per the National Electric Code (ANSI/NFPA 70) or other local codes, as applicable. The resistance of the ground path from the ISD barrier ground to the ground electrode must be less than 1 Ohm.
6. The ISD must not be connected to devices that use or generate more than 250 Vrms or dc with respect to earth.
7. This associated apparatus (ISD) has not been evaluated for use in combination with another associated apparatus.
8. A. For installations in which both the  $C_i$  and  $L_i$  of the intrinsically safe apparatus exceeds 1% of the  $C_o$  and  $L_o$  parameters of the associated apparatus (excluding the cable), then 50% of  $C_o$  and  $L_o$  parameters are applicable and shall not be exceeded.  
 B. The output current of this associated apparatus is limited by a resistor such that the output voltage-current plot is a straight line drawn between open-circuit voltage and short-circuit current.

ISD Entity Parameters:  $V_t = 27.6 \text{ V}$      $I_t = 40.5 \text{ mA}$      $C_a = 86 \text{ nF}$      $L_a = 216.7 \mu\text{H}$      $P_o = 279 \text{ mW}$      $U_m = 250 \text{ Vrms}$

Revision Date: 9-23-10