INTRINSICALLY SAFE DUPLEXER

MADE IN THE U.S.A.

DESCRIPTION

The Intrinsically Safe Duplexer, ISD, is a low cost SCADA ready intrinsically safe pump controller designed to perform level control for duplex lift station applications.

The controller's level inputs may be connected to either five float switches, five single point conductance probes, or five selected points on a ten point conductance probe.

The level inputs are intrinsically safe and allow maintenance personnel to safely handle the float switches or conductance probes while the unit is in operation.

The unit provides a 10 second power-up start delay, a 5 second lag pump delay, and duplex alternation.

The unit has LEDs that show power on status, level input status, pump call status, high & low alarm status, and level input out-of-sequence indication.

Relay contacts are provided for the pump 1 & 2 call, and high & low level alarm outputs.

Toggle switches allow the operator to set the Hand, Off, or Auto mode for each pump, to select automatic alternation, or to set one pump as lead.

Level simulation (Push-to-Test) is accomplished by pressing and holding the push-button. Releasing the push-button allows the simulated level to return to normal.

The high level status indication latches upon high level, until reset by pressing the reset push-button (the high level relay does not stay latched).

The out-of-sequence logic detects when the inputs fail to close in the correct order. The logic also compensates for most out-of-sequence conditions and allows for continued pump operation.

Connecting the RS-232 serial port (or optional Ethernet Port) to a SCADA system allows the lift station to be monitored and controlled remotely.

The Low level input operates as a redundant off.

Additional setup and troubleshooting features are available using the separately supplied Touch Screen Interface Device (TSID).

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UL 913

UL FILE #E189808

This associated apparatus provides intrinsically safe circuits for use in Class I, Groups A, B, C, D Class II, Groups E, F, G and Class III – Hazardous locations in accordance with the UL Control Drawing No. 0302.

SPECIFICATIONS

Input Power:	120VAC ± 10%, 7.7 VA max
Agency Approvals:	UL 913, CAN/CSA
Ambient Operating Temperature:	-20°C to +60°C (-4°F to +140°F)
Indicators:	LED
Color:	White with Blue Silkscreen
Relays:	6A @ 120VAC
Enclosure Material:	Aluminum

ORDERING INFORMATION

ISD - X X

Product Type

Mounting Options

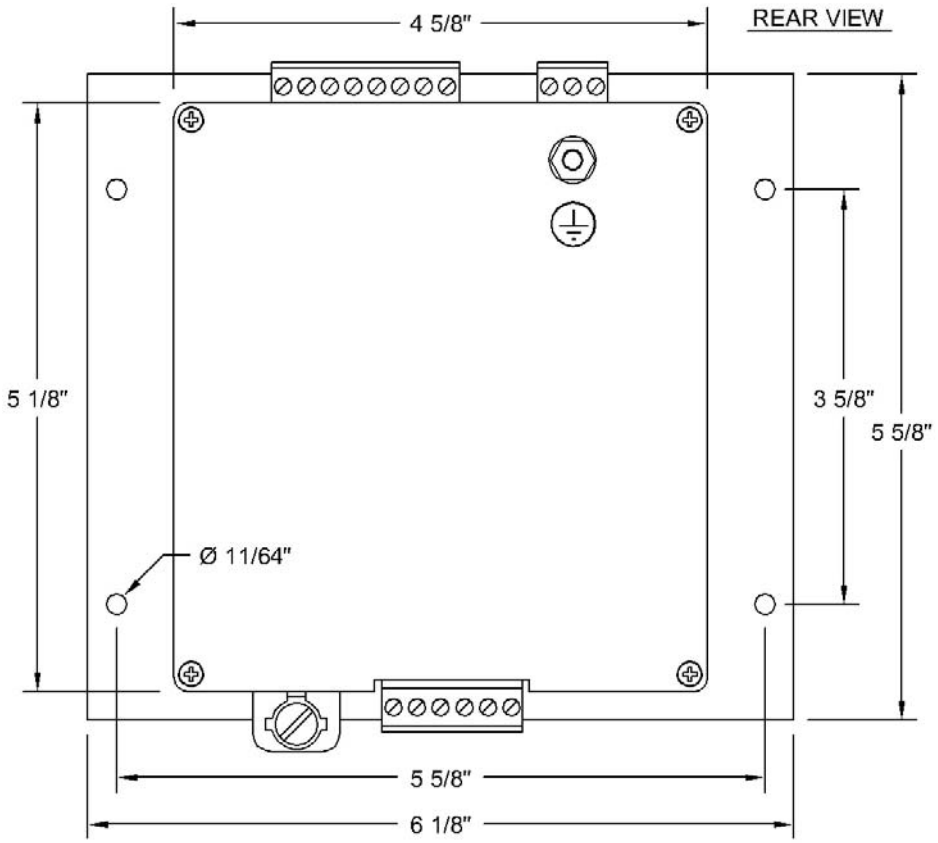
Communications Option

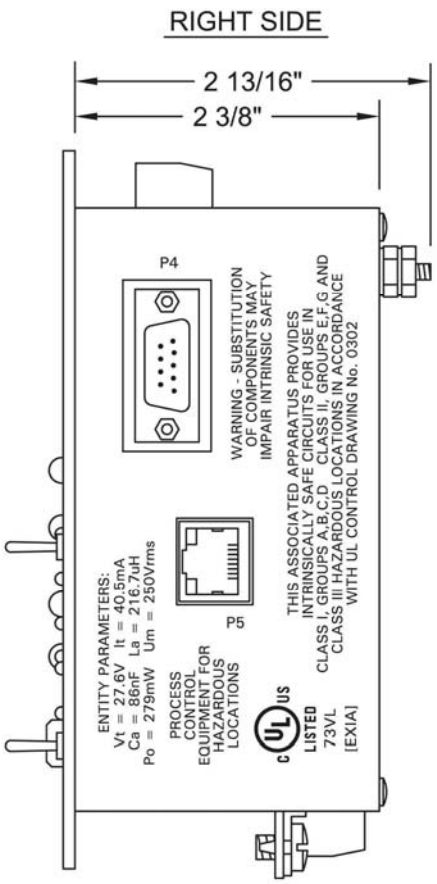
Case Options: S = Surface Mount
D = Din Rail Mount
P = Panel Mount

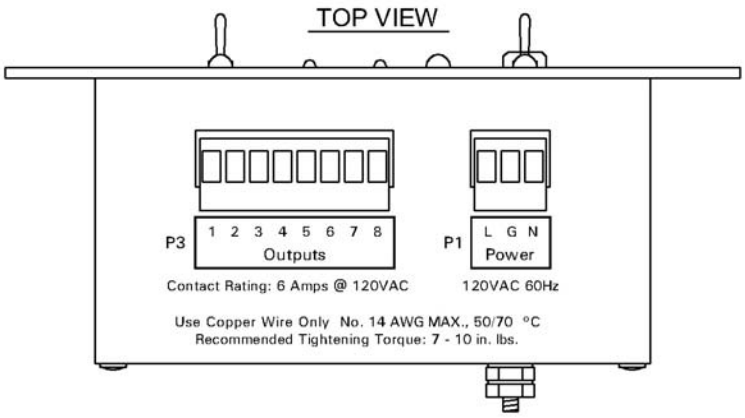
Communications Option: Blank = Standard Unit
E = Ethernet Port

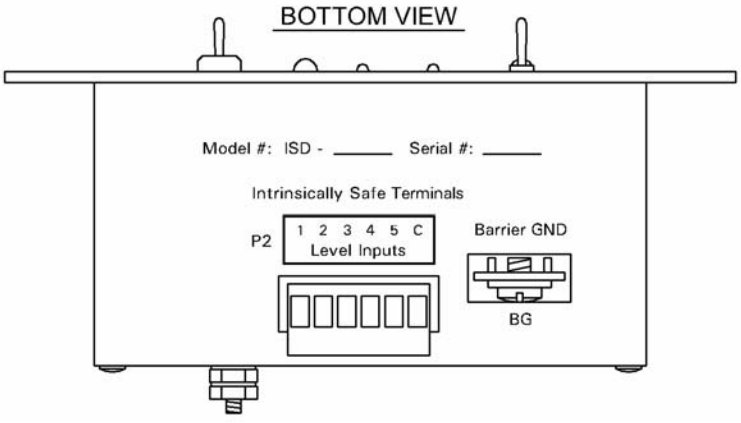
INTRINSICALLY SAFE DUPLEXER - PANEL MOUNT VERSION

Drawings not to Scale



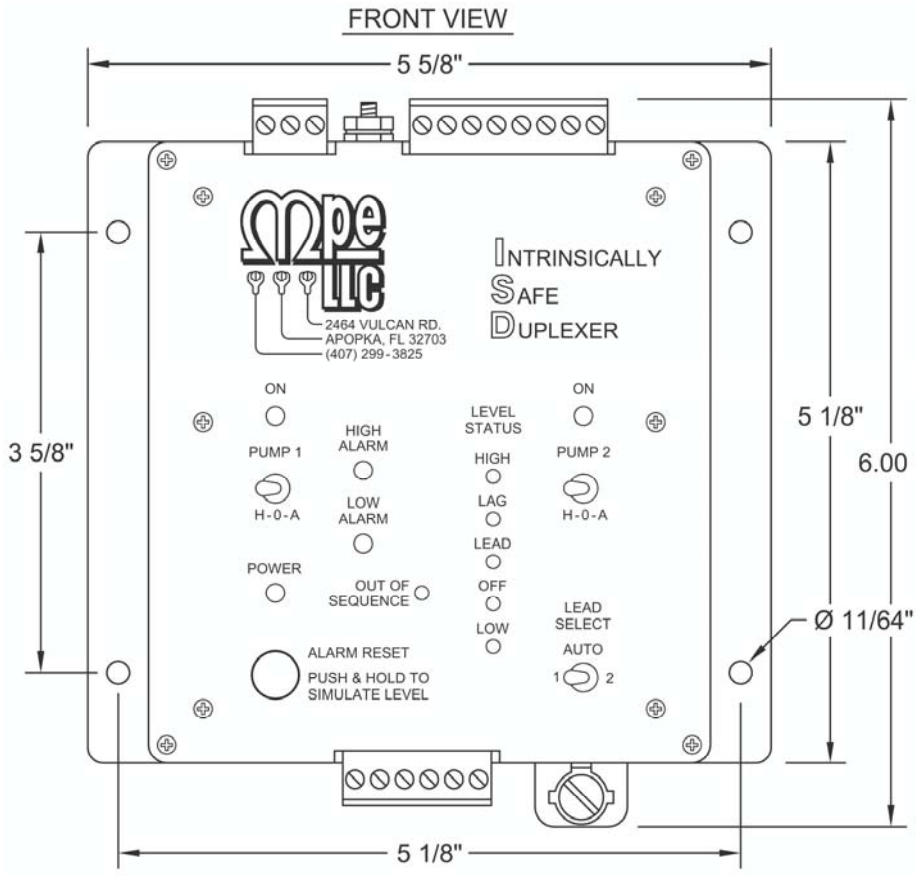


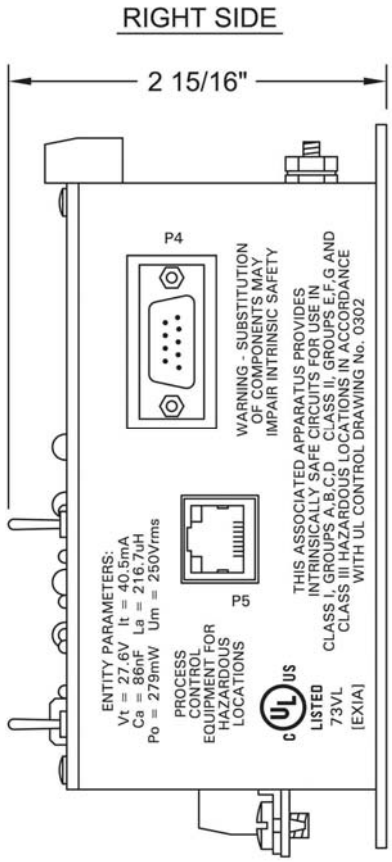


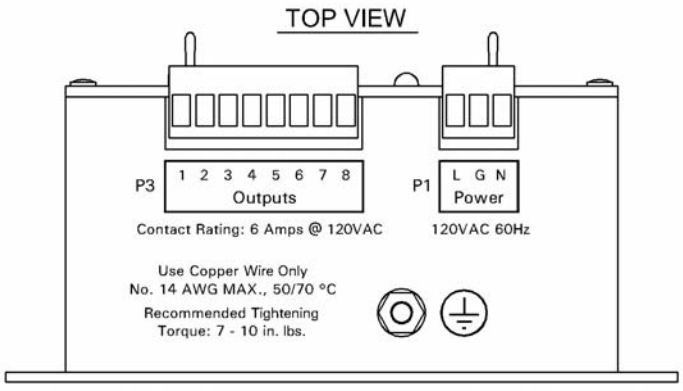


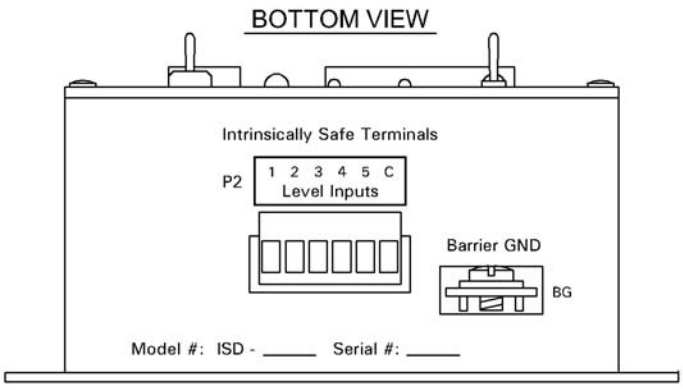
INTRINSICALLY SAFE DUPLEXER - SURFACE MOUNT VERSION

Drawings not to Scale





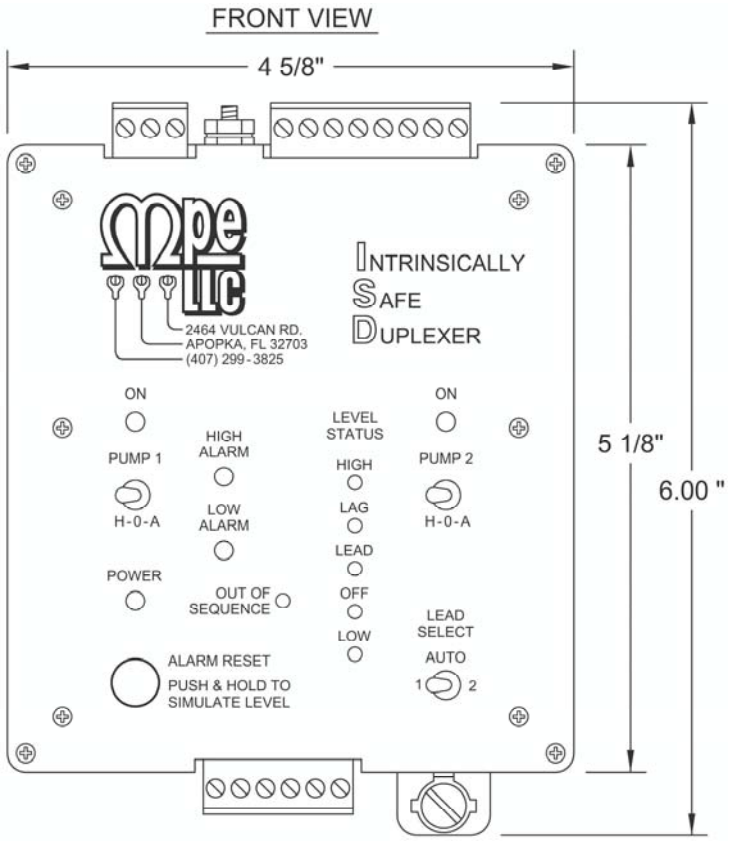




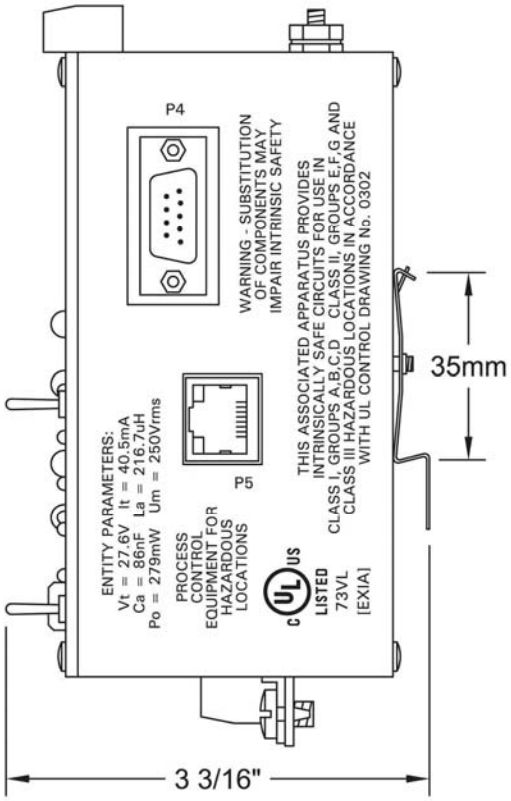
INTRINSICALLY SAFE DUPLEXER - DIN RAIL MOUNT VERSION

Drawings not to Scale

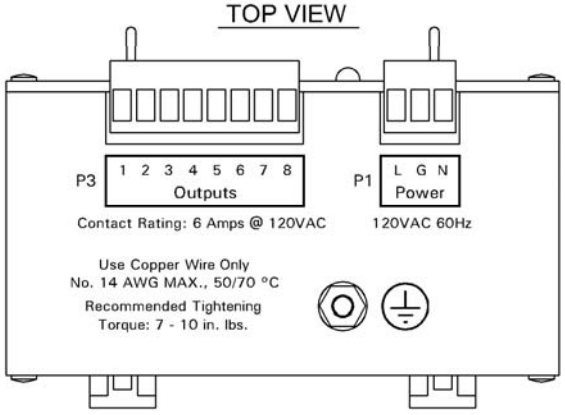
FRONT VIEW



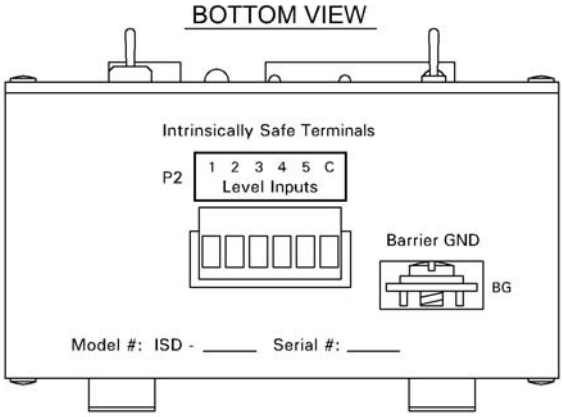
RIGHT SIDE



TOP VIEW



BOTTOM VIEW



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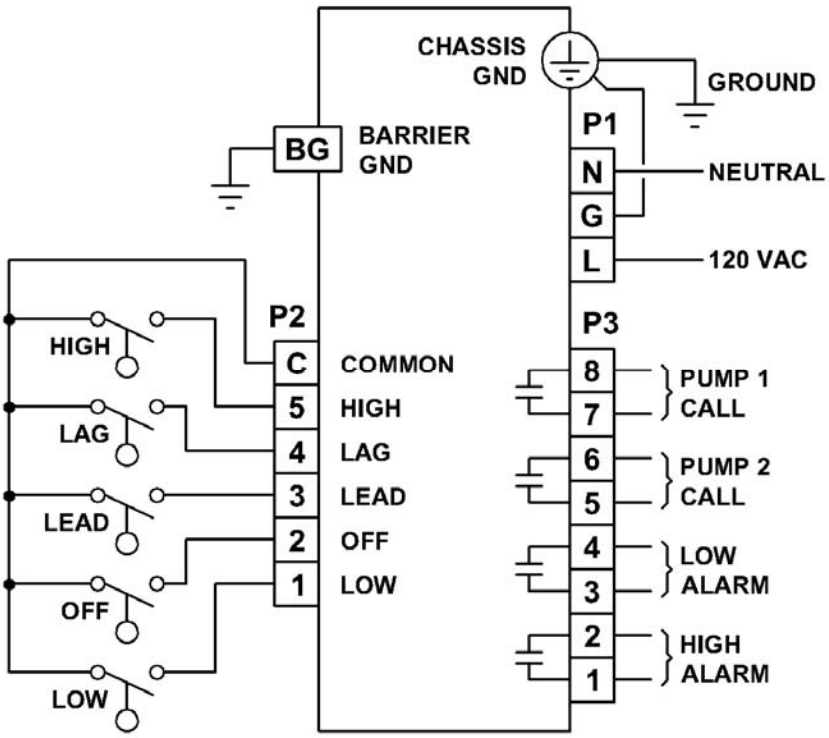
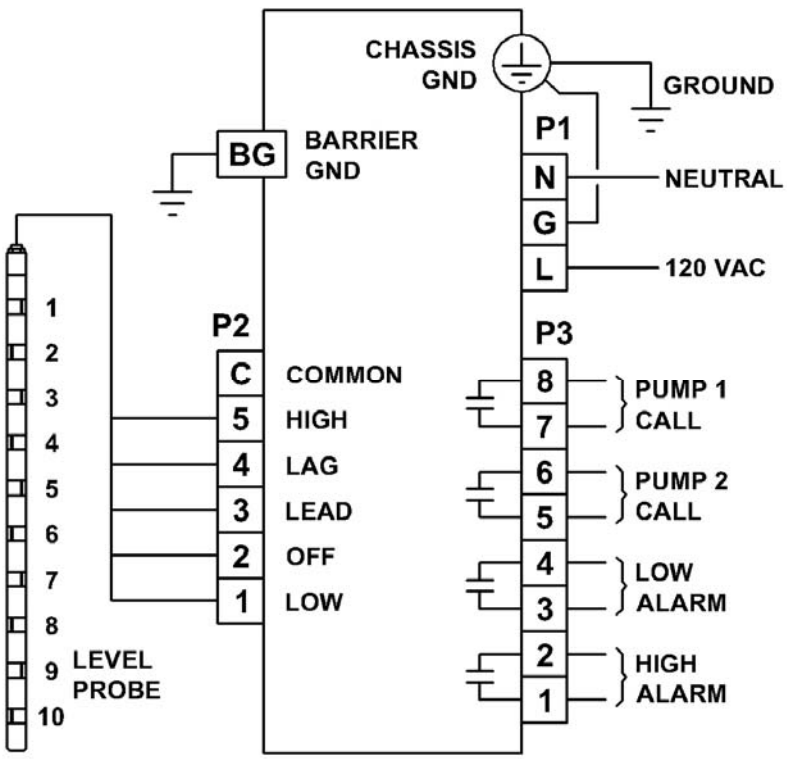
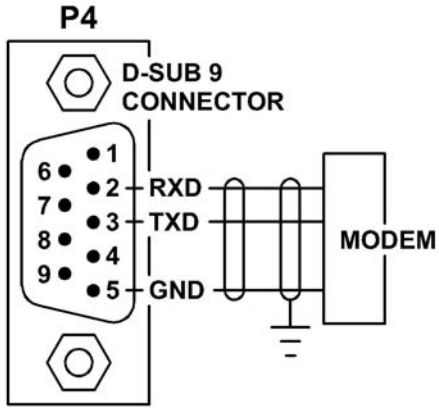


Note:
If the Low Level Alarm is not required place a jumper wire between terminals 1 and C on connector P2.

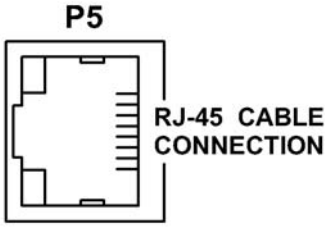
CONNECTION DIAGRAM - FLOAT SWITCH



CONNECTION DIAGRAM - LEVEL PROBE



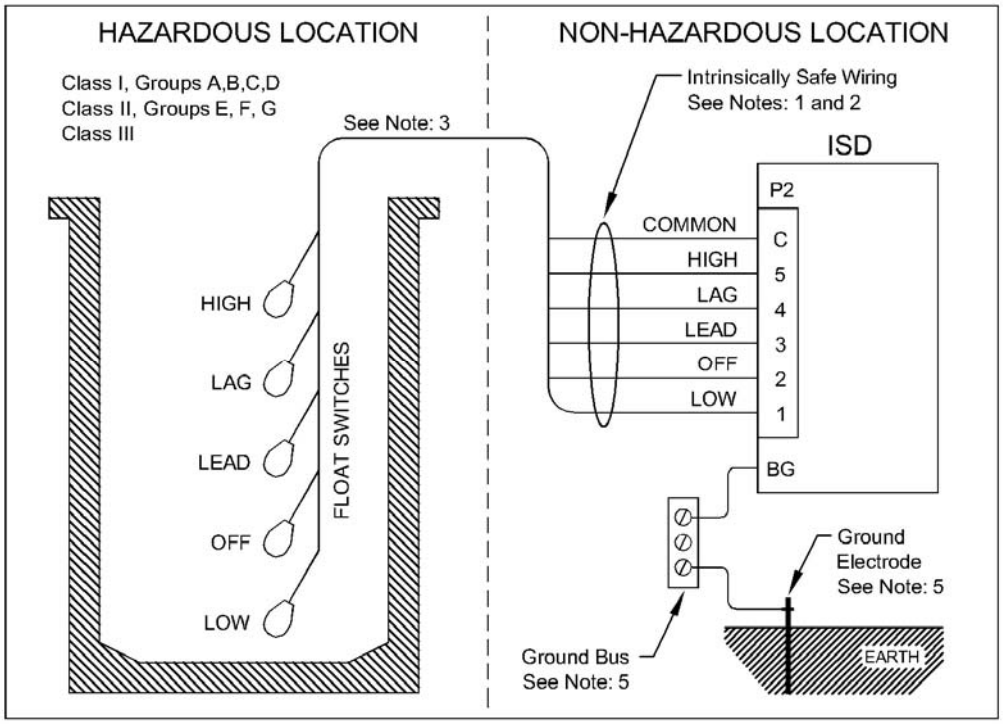
RS-232 SERIAL PORT



Optional ETHERNET PORT

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 (Ci) must be less than the capacitance (Ca) marked on the ISD. Also, the Float Switch's cable inductance plus its equipment Inductance (Li) must be less than the inductance (La) 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 µH/ft are to be used. Cable capacitance and cable inductance are calculated as follows: 60 pF/ft x 1000 ft = 60 nF 0.2 µH/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 Ci and Li of the intrinsically safe apparatus exceeds 1% of the Co and Lo parameters of the associated apparatus (excluding the cable), then 50% of Co and Lo parameters are applicable and shall not be exceeded.

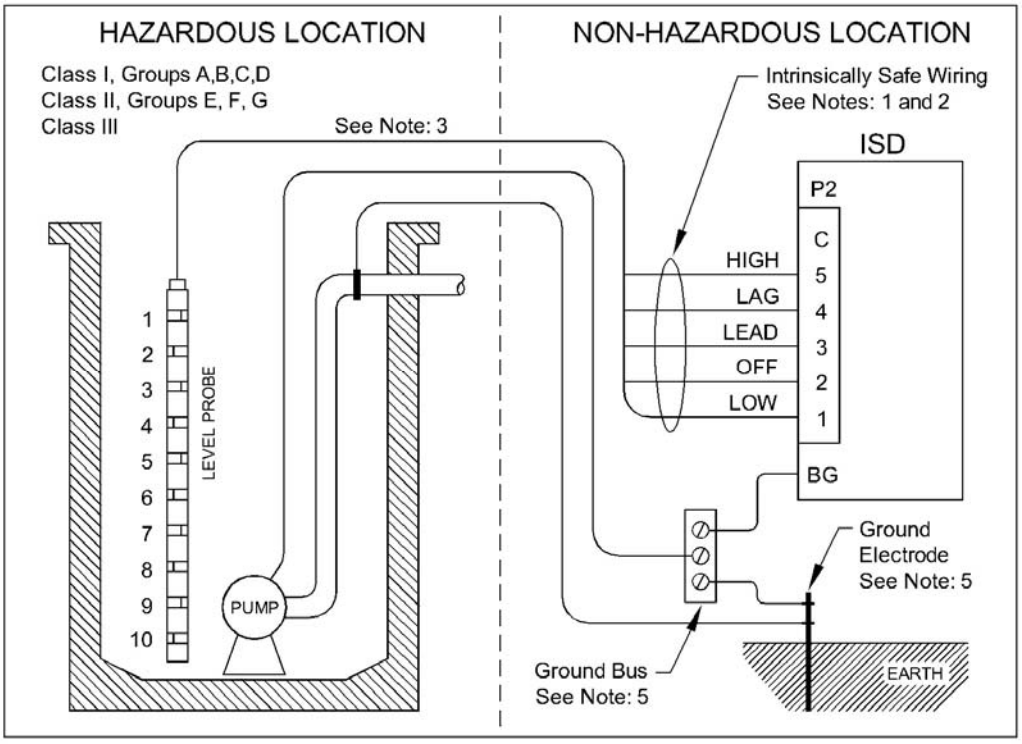
   B. The output current of this associated apparatus is limited by a resistor such that the output voltage-current plot is a straight line drawn between open-circuit voltage and short-circuit current.

ISD Entity Parameters: Vt = 27.6 V It = 40.5 mA Ca = 86 nF La = 216.7 uH Po = 279 mW Um = 250 Vrms

Revision Date: 9-23-10

INTRINSICALLY SAFE DUPLEXER ISD

Control Drawing No. 0302 Page 2 of 3 GROUNDED 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 (Ci) must be less than the capacitance (Ca) marked on the ISD. Also, the Probe's cable inductance plus the Probe's intrinsically safe equipment Inductance (Li) must be less than the inductance (La) 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 µH/ft are to be used. Cable capacitance and cable inductance are calculated as follows: 60 pF/ft x 1000 ft = 60 nF
   0.2 µH/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 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 Ci and Li of the intrinsically safe apparatus exceeds 1% of the Co and Lo parameters of the associated apparatus (excluding the cable), then 50% of Co and Lo parameters are applicable and shall not be exceeded.

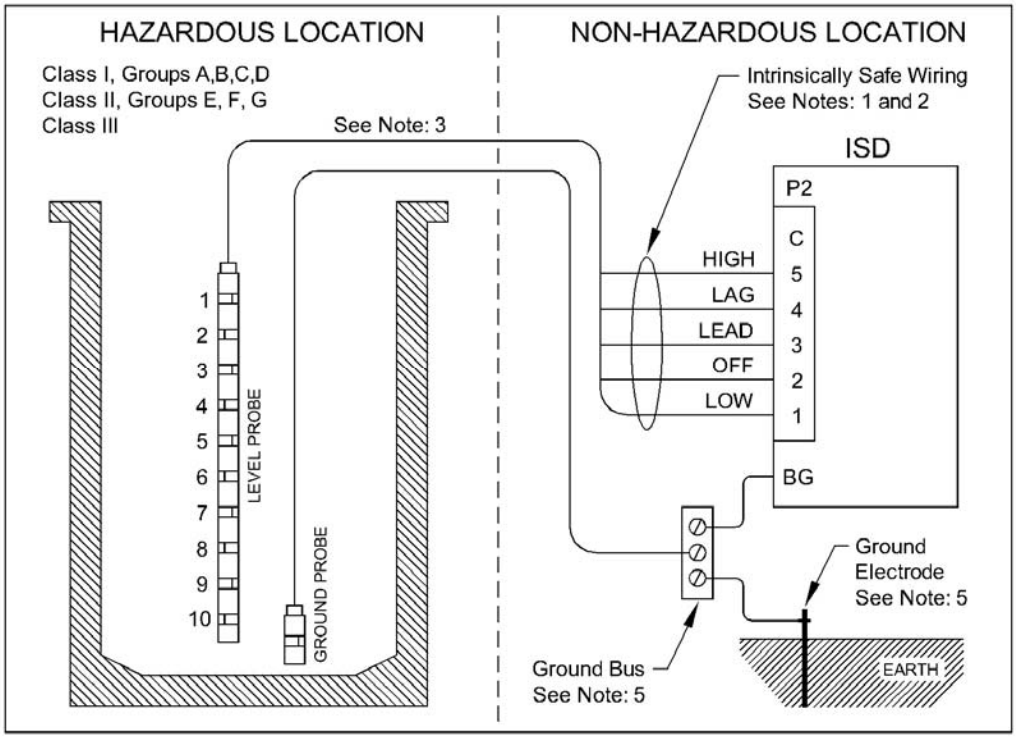
   B. The output current of this associated apparatus is limited by a resistor such that the output voltage-current plot is a straight line drawn between open-circuit voltage and short-circuit current.

ISD Entity Parameters: Vt = 27.6 V It = 40.5 mA Ca = 86 nF La = 216.7 uH Po = 279 mW Um = 250 Vrms

Revision Date: 9-23-10

INTRINSICALLY SAFE DUPLEXER ISD

Control Drawing No. 0302 Page 3 of 3 UNGROUNDED 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 (Ci) must be less than the capacitance (Ca) marked on the ISD. Also, the Probe's cable inductance plus the Probe's intrinsically safe equipment Inductance (Li) must be less than the inductance (La) 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 µH/ft are to be used. Cable capacitance and cable inductance are calculated as follows: 60 pF/ft x 1000 ft = 60 nF
   0.2 µH/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 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 Ci and Li of the intrinsically safe apparatus exceeds 1% of the Co and Lo parameters of the associated apparatus (excluding the cable), then 50% of Co and Lo 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: Vt = 27.6 V It = 40.5 mA Ca = 86 nF La = 216.7 uH Po = 279 mW Um = 250 Vrms

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