# TOUCH SCREEN INTERFACE DEVICE



# **DESCRIPTION**

The Touch Screen Interface Device (TSID) is an optional piece of equipment that is used to perform troubleshooting, customization, and Demo of SCADA features for the following MPE products:

#### DUPLEXER

INTRINSICALLY SAFE DUPLEXER (ISD) WIRELESS TRANSDUCER

Typical Uses of the Touch Screen Interface Device:

- View Status of Discrete and Analog I / O
- Setup of Parameters Such As: Pump Up / Down Mode Lag Pump Delay Level Input Sensitivity SCADA Communication
- View and Reset Fault Codes
- Demo SCADA Features



The Touch Screen Interface Device (TSID) consists of a 6 inch Touch Screen panel made by Automation Direct, housed in a durable carrying case with a power cord and an interface cable for connection to the serial port. It is programmed as a Modbus Master that continually polls the device it's connected to.

### **ORDERING INFORMATION**

Part Number: TSID



# **INTRINSICALLY SAFE RELAY**

MADE IN THE U.S.A.

**FEATURES**:

LED Indicator Surge Protection Relay Contact Output Din Rail Mounting Socket Included



# **OPERATION**

The Intrinsically Safe Relay provides a safe and reliable method of load control when interfaced with a contact closure in a hazardous location. When the control switch input is closed between pins 1 and 8, the output relay becomes energized, and the LED is illuminated. When the control switch input is open, the output relay is deenergized, and the LED is turned off.

| <b>TYPICAL APPLICATIONS</b><br>Lift station controls where intrinsic safety is required.<br>Anywhere an interface is required where the contact<br>closure is in a hazardous location and the controls are<br>in a non-hazardous location. |   | CUL FILE<br>#E189808   |
|--|---|--|
| SPEC<br>Operating Voltage:<br>Output Rating:<br>Power Consumption:<br>Operating Temp:<br>Storage Temp:<br>Enclosure:   | SPECIFICATIONS<br>e: 120 VAC, ± 10%, 50/60 Hz<br>10A @ 120 VAC Resistive<br>on: 1.25 VA<br>-20 to +60 °C<br>-45 to +85 °C<br>Lexan<br>8 Pin, Round<br>8 Pin, Din Rail Mount with<br>Special Locking Tab | This associated apparatus provides<br>intrinsically safe circuits for use in<br>Class I, Groups A, B, C, D<br>Class II, Groups E, F, G and<br>Class III - Hazardous Locations<br>in accordance with the<br>M.P.E. drawing Number 0301. |
| Base:<br>Socket:   |   | ORDERING INFORMATION<br>Part Number: 030-120-118   |



Notes for UL Control Drawing 0301:

- 1. All intrinsically safe wiring shall be separated from non-intrinsically safe wiring. Refer to article 504 of the National Electric Code (ANSI/NFPA 70) for installation of intrinsically safe wiring.
- 2. Maximum distance between unit and switch contacts is 1000 feet.
- 3. Switch contact shall be any non-energy storing or generating switch type device containing no capacitance or inductance.
- 4. Device must be installed in MPE socket P/N DS-8-A or PF083A <u>and</u> with locking clips attached to base.
- 5. Cable capacitance plus intrinsically safe equipment capacitance (Ci) must be less than the marked capacitance (Ca) and cable inductance plus intrinsically safe equipment inductance (Li) must be less than the marked inductance (La) shown any barrier.
- 6. The simple apparatus (Float Świtch) connected to the ISR shall not be mounted on other electrical apparatus that has a voltage and current rating higher than the ISR (See Enity Parameters Voc and Isc below). A simple apparatus (Such as a Float Switch) is defined as an electrical component or combination of components of simple construction with well defined electrical parameters that does not generate more than 1.5V, 100mA and 25mW, or a passive component that does not dissipate more than 1.3W and is compatible with the intrinsic safety of the circuit in which it is used.
- 7. If the electrical parameters of the cable are unknown, then a capacitance value of 60pF/ft and an inductance of 0.20uH/ft are to be used.
- 8. Entity Parameters: Voc = 9.33V Isc = 0.218mA Ca = 3.6uF La = 100mH

Order from: C A Briggs Company; 622 Mary Street; Suite 101 - Warminster, PA 18974 Phone: 267-673-8117 - Fax: 267-673-8118; E-Mail: <u>Sales@cabriggs.com</u> - <u>www.cabriggs.com</u> 38



# INTRINSICALLY SAFE BARRIER ISB10

#### Control Drawing No. 0303 Page 1 of 2

#### **TYPICAL LIFT STATION APPLICATION**



#### Notes for Control Drawing 0303 Page 1 of 2:

- 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), Section 18 of the Canadian Electric Code, or other local codes, as applicable.
- 2. Maximum distance between Barrier and Probe is 100 feet.
- 3. The Probe's cable capacitance plus the Probe's intrinsically safe equipment capacitance (Ci) must be less than the marked capacitance of the Barrier (Ca). Also, the Probe's cable inductance plus Probe's intrinsically safe equipment Inductance (Li) must be less than the marked inductance (La) shown on Barrier. 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 100 ft = 6 nF
- 4. The Barrier 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 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), Section 18 of the Canadian Electric Code, or other local codes, as applicable. The resistance of the ground path from the Barrier to the ground electrode must be less than 1 Ohm.
- 6. The Barrier must not be connected to devices that use or generate more than 250 Vrms or dc with respect to earth.
- 7. This associated apparatus (Barrier) has not been evaluated for use in combination with another associated apparatus.

Barrier Entity Parameters: Vt = 30.3 V It = 88.6 mA Ca = 64 nF La = 4.5 mH Po = 336 mW Um = 250 Vrms

Revision Date: 6-19-15

# INTRINSICALLY SAFE BARRIER ISB10

## Control Drawing No. 0303 Page 2 of 2

## UNGROUNDED TANK APPLICATION



Notes for Control Drawing 0303 Page 2 of 2:

- 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), Section 18 of the Canadian Electric Code, or other local codes, as applicable.
- 2. Maximum distance between Barrier and Probe is 100 feet.
- 3. The Probe's cable capacitance plus the Probe's intrinsically safe equipment capacitance (Ci) must be less than the marked capacitance of the Barrier (Ca). Also, the Probe's cable inductance plus Probe's intrinsically safe equipment Inductance (Li) must be less than the marked inductance (La) shown on Barrier. 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 100 ft = 6 nF
- 4. The Barrier 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 probe and the 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), Section 18 of the Canadian Electric Code, or other local codes, as applicable. The resistance of the ground path from the Barrier to the ground electrode must be less than 1 Ohm.
- 6. The Barrier must not be connected to devices that use or generate more than 250 Vrms or dc with respect to earth.
- 7. This associated apparatus (Barrier) has not been evaluated for use in combination with another associated apparatus.

Barrier Entity Parameters: Vt = 30.3 V It = 88.6 mA Ca = 64 nF La = 4.5 mH Po = 336 mW Um = 250 Vrms

Revision Date: 6-19-15



# **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).





### **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                        |
|                     |                                 |



# **INTRINSICALLY SAFE DUPLEXER - PANEL MOUNT VERSION**



# **INTRINSICALLY SAFE DUPLEXER - SURFACE MOUNT VERSION**



# **INTRINSICALLY SAFE DUPLEXER - DIN RAIL MOUNT VERSION**



# **INTRINSICALLY SAFE DUPLEXER**





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

## **CONNECTION DIAGRAM - FLOAT SWITCH**



# 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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