



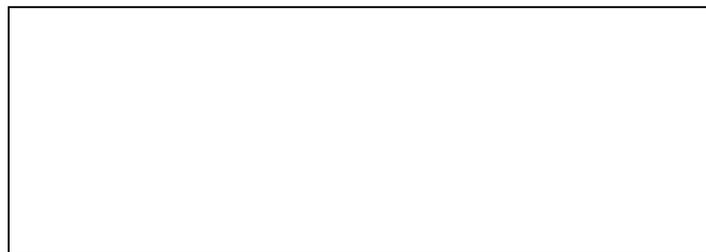
# INSTALLATION & OPERATIONS MANUAL

## CP SERIES DUPLEX PUMP CONTROL PANEL CP67BXXX1XX

### **IMPORTANT:**

Completely read and thoroughly understand these instructions before proceeding to install and wire the control panel.

For assistance contact your local distributor or Gems Sensors Inc. directly



or directly at

**Gems Sensors Inc.**

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## **INSTALLATION INSTRUCTIONS**

**IMPORTANT:** Completely read and thoroughly understand these instructions before proceeding to install and wire the control. This manual is a generic guide and may not be specific to the panel provided. Refer to the part number for specific options chosen on drawing TD-198500 sheet 1.

Mount control box vertically on wall or other solid structure. The maximum distance between the control box and the location of the electrodes is determined by the sensitivity of the 67 control(s). This information is supplied on Form 670 (Bulletin P/N 100501-1).

### **INTRINSICALLY SAFE GENERAL INFORMATION**

**IMPORTANT:** BEFORE PROCEEDING TO INSTALL AND WIRE THE ALARM PANEL, READ AND THOROUGHLY UNDERSTAND THESE INSTRUCTIONS.

The following information should be used by experienced personnel as a guide to the installation of intrinsically safe alarm panels. Selection or installation of equipment should always be accompanied by competent technical assistance. We encourage you to contact Warrick or its local representative if further information is required.

The control panel contains a UL Listed interface relay with Intrinsically Safe Sensing Circuits. The interface relay is Associated Apparatus listed under Process Control equipment, with Intrinsically Safe Outputs for Interface into Division 1 Hazardous Locations. The Circuits are to be connected to any simple non-energy generating or storing device such as a pushbutton, limit, float switch, or any Warrick electrode and fitting assembly.

The control panel is pre-assembled and ready to wire. Locate the panel in a non-hazardous area where an explosive environment does not exist.

Cabinet and mounting plate to be connected to a good earth ground. For additional guidance on "Hazardous Location Installation," and "Intrinsically Safe Devices," consult ANSI/ISA standard RP 12-6 or NEC ARTICLES 500 through 516.

### **CAUTION:**

Intrinsically safe wiring must be kept separate from non-intrinsically safe wiring. Special procedures have been followed during the manufacturing of these control panels to insure proper spacing. Some models incorporate isolated barriers or covers for this purpose.

A separate rigid metallic conduit should be used to enclose the conductors of the intrinsically safe circuit. Multiple runs of intrinsically safe wiring may be run in the same conduit only where at least 0.25mm (0.010 inch) thick insulation, suitable for the maximum temperature, is used on each conductor. Refer to ANSI/ISA RP 12.6 for details. Conduit or cable, containing the intrinsically safe wiring, shall be sealed in accordance with the National Electrical Code, NFPA No. 70, (approved sealing fitting), where the conduit enters or exits the hazardous locations.

**INDUCTANCE AND CAPACITANCE:** For intrinsically safe wiring use 16 AWG or 14 QWG TYPE THHN/THHW/THWN or MTW. By using these types of wire in conjunction with a limitation on distance, you will not exceed the maximum capacitance or inductance for field wiring.

Use the following chart as a guide for maximum total length of all the intrinsically safe wiring (of each conductor), excluding any ground wiring.

#### **WARRICK INTERFACE RELAY**

<b>MODEL NUMBER</b>	<b>HAZARDOUS LOCATIONS</b>	<b>MAXIMUM CABLE LENGTH SHALL NOT EXCEED</b>
67 Series	Class I, Group C, D Class II, Group E, F, G Class III, Division I	16,000

**NOTE:**

Refer to Series 67 data information for distance recommendations so not to exceed the maximum capacitance or inductance limitations of the control.

**WIRING INSTRUCTIONS**

**NOTE:** All wiring shall be in accordance with the National Electrical Code.

**The minimum allowable wire size is 14 AWG and of type THHN or MTW.**

The ground terminal provided inside the enclosure, on the back panel, must be connected to electrical ground.

**Caution:** Bonding between conduits must be made.

All conduit entrances and any external metal parts that may become energized must be grounded via the ground terminal provided on the back panel.

Circles with diagonals  on wiring diagram represent terminals provided for external connections. Connections to these terminals should be made using UL approved crimp type spade lugs. The maximum allowable connections per terminal are 2.

Terminal pairs 3 – 10 are isolated load contacts and must be wired in series with its load and that series branch circuit connected across a power source compatible with the load.

Connect terminal pair L1 – L2 to AC supply line of electrical characteristics indicated on data label and drawing. Fuse protection has not been provided. Do not exceed electrical characteristics indicated on data label and drawing. Maximum fuse rating is not to exceed 3 AMPS.

Connect terminals pair 3 – 4 into the motor starter circuit of pump #1. This circuit not to exceed 3AMP @ 120 VAC.

Connect terminals pair 5 – 6 into the motor starter circuit of pump #2. This circuit not to exceed 3AMP @ 120 VAC.

Connect terminals pair 7 – 8 into the circuit of the remote HIGH level alarm device. This circuit not to exceed 3AMP @ 120 VAC.

Connect terminals pair 9 – 10 into the circuit of the remote LOW level alarm device. This circuit not to exceed 3AMP @ 120 VAC.

**Electrode Wiring**

Wiring must be provided to the electrodes as shown on the drawing provided. The electrode wiring should be thermoplastic insulated and be installed in a separate dry metallic conduit. Terminal 20 must be grounded to the vessel if metallic. If the electrode fitting used has a metallic body and is supported directly upon a metallic vessel, the ground connection is facilitated by securing that end of the ground conductor beneath the head of one of the screws which fasten the terminal housing to the body of the fitting. *When the vessel is non-metallic, terminal 20 must be connected to an additional electrode of length equal to or longer than, the longest electrode.*

**Float Switch Wiring**

Wiring must be provided to the float switches as shown on the drawing provided. The float switches wiring should be thermoplastic insulated and be installed in a separate dry metallic conduit.

Connect terminals 11 and 12 to the normally open HIGH level float switch.

Connect terminals 13 – 18 to the normally open pump start and stop float switches based on the pumping operation (i.e. pump down).

Connect terminals 19 and 20 to the normally open LOW level float switch.

## **OPERATING INSTRUCTIONS**

Hand-Off-Automatic selector switches may be provided for the pumps allowing them to be operated automatically or manually. To energize the pumps, turn the respective switch to the "Hand" position. To de-energize the pumps, turn the respective switch to the "Off" position. These switches will normally be in the "AUTO" position and operation will then be as follows.

The series 67 control is equipped with an automatic pump alternator. The pumps will alternate when the lead pump stops beginning with pump #1. When the level rises to lead pump electrode or float pump #1 will energize. When the level recedes to the pump stop(s) electrode or float the alternator will sequence to pump #2. On the next lead pump start pump #2 will energize. Should both pumps be required then both pumps will energize and the cycle will reset to pump #1.

### **Pump Down**

The lead pump will be started when the tank level rises to the lead pump START electrode or float and will continue in operation until the level is reduced below pump(s) STOP electrode or float.

Should the pump be unable to meet the demand or fail completely and the level rises to the lag pump START electrode or float, the lag pump will be started and will continue in operation until the level is reduced below pump(s) STOP electrode or float.

### **Pump Up**

The lead pump will be started when the tank level recedes below the lead pump START electrode or float and will continue in operation until the level rises to the pump(s) STOP electrode or float.

Should the pump be unable to meet the demand or fail completely and the level recedes below the lag pump START electrode or float, the lag pump will be started and will continue in operation until the level rises to the pump(s) STOP electrode or float.

### **High Alarm**

If the tank level rises to the HIGH LEVEL electrode or float, the high level alarm light will illuminate.

If the audible alarm option was chosen the following will also occur:

The audible alarm horn will sound and the contacts connected to terminal pair 7 – 8 will close. The contact will remain closed until the high level condition is corrected. The audible alarm can be silenced by momentarily depressing the SILENCE pushbutton, however, the light will remain on until the abnormal condition is corrected.

### **Low Alarm**

If the tank level rises to the LOW LEVEL electrode or float, the low level alarm light will illuminate.

If the audible alarm option was chosen the following will also occur:

The audible alarm horn will sound and the contacts connected to terminal pair 9 – 10 will close. The contact will remain closed until the high level condition is corrected. The audible alarm can be silenced by momentarily depressing the SILENCE pushbutton, however, the light will remain on until the abnormal condition is corrected.