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# DUPLEX CONTROLLER

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## ANALOG PRIMARY CONTROL and FLOAT BASED REDUNDANT CONTROL

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## MODEL CA-2PDA

### FEATURES

- Primary analog control of duplex constant speed pump applications
- Redundant float control
- Monitor Output & selectable Abnormal Level Output (High, Low or Common)
- Alarm Silence input
- Running Time Meters, Pump Start counters, Duplex Pumping Statistics
- Pump alternator selector switch inputs (Automatic [FOFO], Fixed 1-2 or Fixed 2-1)

The CA-2PDA is a duplex pump controller that operates under an ingenious dual control strategy consisting of a primary analog control and a redundant float based control. The CA-2PDA incorporates First-On/First-Off (FOFO) pump alternation to minimize the number of pump starts.

The CA-2PDA's control span is user configurable. The controller accepts a nominal 4-20 mADC input and transforms that input into any calibrated span to 40' and beyond. The controller is ideally suited for use with Contegra's SLX 130-M submersible transducer.

The CA-2PDA also accepts up to two float switch inputs for redundant pump control (Pump Add and Pump Off). The CA-2PDA redundant control strategy is based on Contegra's field proven CD-2R redundant controller.

All of the analog setpoints are adjustable in feet and tenths of feet. The analog setpoints include: Low Level On & Off, Lead Pump On & Off, Lag Pump On & Off and High Level On & Off.

The CA-2PDA's redundant control strategy accepts either one or two float inputs. The float based control strategy operates in parallel with the primary sensor's analog control. The redundant control provides differential control based on either an Off Float or an Off-Delay Timer.

When a single float input is used, the CA-2PDA provides timed ON & OFF operation based on the input's continued activation (e.g. add pump capacity) or deactivation (e.g. pump(s) timed-off as a group). When two float switches are used the CA-2PDA provides immediate OFF operation when the OFF input deactivates.

The CA-2PDA provides a programmable Abnormal Level Alarm output. The controller has an external alarm silence/acknowledge input. The alarm automatically resets at the Alarm Off setpoint.

Two Pump Running inputs are provided to advance the controller's integral Running Time Meters, increment the Start Counters and develop the Duplex Pumping statistics.

# MODEL CA-2PDA

## Engineering Specifications

Model CA-2PDA Analog Controller  
(Includes Redundant Float Based Control)

This specification covers a complete automatic pump control and alarm system responding to the \_\_\_\_\_ level as shown on the plan drawings.

The controller shall provide duplex pump control based on a 4-20 mA process level input that represents a 0-\_\_\_\_\_ foot level excursion. The controller shall be used in a pump-down control application for automatic control of two constant speed pumps. The controller shall contain individually programmable differential control stages for the Low Alarm On/Off, Lead Pump On/Off, Lag Pump On/Off and High alarm On/Off. The controller shall have an integral operator interface comprised of a 4-line by 12-character backlit LCD display and six pushbutton switches. The display backlighting shall be enabled whenever a pushbutton is pressed. The backlighting shall automatically turn off following a period of keypad inactivity. The LCD display shall provide not only the requisite status information (e.g. tank level & pump operating information) but shall also provide a convenient mechanism by which the control setpoints can be adjusted. The operator shall be able to view the status displays and, while there, conveniently change the pump On/Off setpoints and alarm On/Off setpoints.

The controller shall contain a redundant control strategy that is enabled by the connection of one or two float switches. When using a single high-level float switch the pumps shall be sequentially called into service by the closing of the Pump Add float switch. When the Pump-Add float closes, the controller shall energize a lead pump output. If the float switch remains closed, the controller's internal 'Pump Add' timer shall expire and call for the Lag pump. The 'Pump Add' timer shall be adjustable from 0-99.9 seconds. The redundant control's high-level, Pump Add float-switch shall be mounted above the normal operating

range of the controller's primary analog control system's High Alarm ON setpoint. The pump outputs are deactivated when the 'Pump-Add' float opens and the controller's internal Off-Delay timer expires. The Off-Delay timer shall be keypad programmable from 0-10.00 minutes. When using two float switches the pumps shall be called into service sequentially by the closing of the high-level Pump-Add float switch. The pumps shall then be removed from service upon the opening of the low-level Pump(s) Stop float switch.

The controller shall employ First-On/First-Off (FOFO) automatic alternation to minimize the number of pump starts. The controller shall have provision for an external alternator selector switch that shall allow the selection of either a 1-2, FOFO or 2-1 pumping sequence. The controller shall contain four relay outputs. Two outputs shall be used for pump control. The controller shall contain a programmable alarm output (Low Alarm, High Alarm or both Low and High Alarm) and alarm monitor relay output. The alarm output shall automatically silence and reset following the end of each pumping cycle. The controller shall accept an external alarm acknowledge/silence input. The controller shall be UL 508 Listed. The controller shall be a CONTEGRA CA-2PDA.

## Specifications

**Power:** 24 VDC (20.4 - 28.8 VDC) reverse polarity protection. The 24 VDC can also power the submersible level transducer.

**Display:** LCD (Liquid Crystal Display) 4 lines by 12 characters

**Inputs:** Eight, +VDC (input power), non-isolated

**Analog:** One — 0-10 VDC  
The controller is provided with a 470Ω resistor for a 4-20 mA process level input.

**Digital:** Seven  
**Off Voltage:** < 5 VDC  
**On Voltage:** > 8 VDC

**Relays:** 4 independent, normally open, isolated, rated 10A @ 120/240 VAC (resistive), 3A @ 120/240 (inductive)

**Dimensions:** 2.8" x 3.5" x 2.2" (WxHxD) DIN rail mounted

[The optional CD-PS24 Power Supply (120/24 VDC) adds 1" to the width of the unit.]

**Weight:** 0.4 pounds (approx.)

**Ratings:** UL 508

**Options:** 120 VAC-24 VDC power supply, DIN Rail mounted.

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### Ordering Information

Model	Control Span	Accessories
CA-2PDA	XX (Notes 1 & 2)	CD-PS24 – 24VDC Power Supply, DIN Mtd.

#### Notes:

- 1) A control span of "--00" denotes a user configured range
- 2) A non-zero control span (e.g. "-10") denotes the factory calibrated span (e.g. 0-10') when the CA-2PDA is purchased in conjunction with a Contegra sensor.

Contegra offers a full line of analog level sensor including the SLX 130, SLX 220, Ultrix 100 and GPX 220. Contegra offers the FS 90 and FS 96 float switches for redundant control activation. Intrinsically safe barriers are also available.



Contegra Inc.  
1286 Carriage Hills Drive  
Eagan, MN 55123

PHONE: 651-905-0900  
FAX: 651-454-4665  
INTERNET: www.Contegra.com