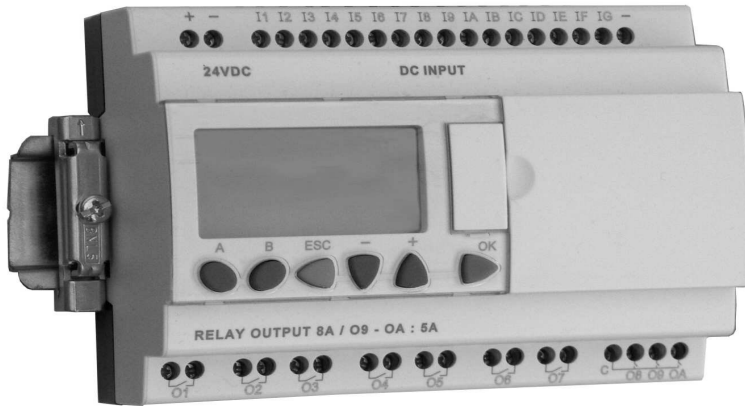

DUPLEX CONTROLLER

ANALOG PRIMARY CONTROL and FLOAT BASED BACKUP CONTROL



MODEL CA-2DRc

FEATURES

- Primary Analog Control of duplex constant speed pump applications
- Backup Float Control using one or up to three float inputs
- Multiple Alarm and Status Outputs
- External Alarm Silence input
- Alternator selector inputs set mode to Automatic [FOFO], Fixed 1-2 or Fixed 2-1
- Running Time Meters (1, 2 and 1 & 2)
- Pump Start Counters (1, 2 and 1 & 2)
- Cycle Timers (1, 2 and 1 & 2)

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

The CA-2DRc's control span is user selectable. The controller accepts a nominal 4-20 mADC input and transforms that input into one of four input ranges: 11.5, 15.0, 23.1 or 34.6 Feet. The controller is ideally suited for use with Contegra's SLX 130-M or MIS submersible transducer.

The CA-2DRc also accepts up to three float switch inputs for redundant pump control (Pump Off, Pump Add, and High Alarm). The CA-2DRc's 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-2DRc's redundant control strategy accepts as few as one (High Alarm) and up to three float inputs (High Alarm, Pump Add & Pump Off). The float based control strategy is enabled when the analog signal is below the Low Alarm On setpoint. Thus, the analog and

float based systems do not conflict for control of the pumps. The float based controller operates in parallel with the primary sensor's analog control. The float based control provides differential control that is based multiple float inputs OR timed pump addition & removal in the event that the Off float is not used.

When a single float input is used, at the High Alarm position, the CA-2DRc 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). When floats are used at the Pump Add and Pump Off position the CA-2DRc provides immediate OFF operation upon deactivation of the OFF input.

The CA-2DRc's alarm and status outputs include: High & Low Alarm, System Monitor, Common Alarm, Audible Driver, Both Pumps Req'd (analog) Both Pumps Req'd (Backup), Backup Control Active. The controller has an external alarm silence/acknowledge input.

MODEL CA-2DRc

Engineering Specifications

Model CA-2DRc Analog Controller (Includes Float Back-Up 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 up to 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 18-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 float based back-up control strategy that is enabled by the connection of one or up to three float switches. When using a single high-level float switch the pumps shall be sequentially called into service by the closing of the High Alarm float switch. When the High Alarm float closes, the controller shall energize a lead pump output. If the float switch remains closed, the controller's internal 'Lag Add' timer shall expire and call for the Lag pump. The 'Pump Add' timer shall be adjustable from 0-120 seconds. The redundant control's high-level, 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 'High Alarm' float opens and the controller's internal Off-Delay timer

expires. The Off-Delay timer shall be keypad programmable from 0-600 seconds. When using two float switches the pumps shall be called into service sequentially by the closing of the high-alarm 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 and thus minimize the number of pump starts. The controller shall have provision for an external alternator override selector switch that shall allow the selection of either a 1-2, FOFO or 2-1 pumping sequence.

The controller shall provide alarm inputs for Pump Unavailable and Pump Seal Failure. The controller shall contain Running Timer Meters, Pump Start Counters and Pump Cycle timers for Pump 1, Pump 2 and Duplex Operation.

The controller shall contain ten relay outputs. Two outputs shall be used for pump control. The controller shall contain the following alarm and status outputs: High & Low Alarm, System Monitor, Common Alarm, Audible Driver, Both Pumps Req'd (analog) Both Pumps Req'd (Backup), Backup Control Active.

The alarm output shall automatically silence and reset following the end of each pumping cycle. The controller shall be UL 508 Listed. The controller shall be a CONTEGRA CA-2DRc.

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 18 characters

Inputs: Sixteen, +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: Fifteen
Off Voltage: < 5 VDC
On Voltage: > 8 VDC

Relays: 10 (7 independent, 3 w/shared common) normally open, isolated, rated 8A/5A

Dimensions: 5" x 4.3" x 2.8" (WxHxD) when mounted on DIN rail

Ratings: UL 508

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

Contegra is the registered trademark of Contegra Inc. Specifications subject to change without notice.

Ordering Information

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

Notes:
1) A control span of "-00" denotes a user selected range
2) A non-zero control span (e.g. "-11") denotes the factory calibrated span (e.g. 0-11.5') when the CA-2DRc is purchased in conjunction with a Contegra sensor.

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

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