

## DR1920 DUPLEX LIFT STATION BACK-UP PUMP CONTROLLER



### DESCRIPTION

The DR1920 Back-Up Pump Control is a compact DIN rail mounted unit used to monitor a backup level alarm in a tank or wet well and start up to two pumps when a high alarm switch closes. The unit is used as a backup to normal tank / well level controls and is wired to the High-High Alarm switch to prevent overflows in situations where the primary level control system fails.

When the level switch in the tank or well closes, the DR1920 closes a relay that starts Pump 1 and starts an internal Timer 1. When Timer 1 reaches its set time, and the level alarm switch is still closed, Pump 2 is started. Pump 1 and Pump 2 will run until the level alarm switch opens. When the level switch contact opens, Timer 2 is started and both pumps continue to run until Timer 2 reaches its set time.

If the alarm switch opens during the Timer 1 interval, Timer 2 is started when the switch opens. Pump 2 is not started and Pump 1 will run until Timer 2 reaches its set time.

The DR1920 also has provisions to alarm on a switch opening.

### ALARM SWITCH MONITOR

The DR1920 monitors the open or closed status of a switch contact that is already wired into a control system. This switch may have any of several voltages that are used to control the pump system. In addition, if the primary control system fails, the normal voltages may not be present.

The DR1920 is wired across the alarm switch contacts and uses a unique circuit that measures the impedance present between the switch contacts. When the DR1920 senses a low impedance, it begins its control function, regardless of any absence or presence of voltage across the switch contacts. This feature allows the DR1920 to be wired in parallel across the switch contacts without regard to the existing control system, permitting simple installation in existing systems. For situations where the existing wiring prevents this circuit from being used, an isolated contact must be provided. A second input, which requires an isolated contact or open collector transistor is also provided.

A Reset input is provided to stop the pumps and reset the timers. It requires a contact closure or open collector transistor.

Since the Back Up Pump Control is used only when there is a problem with the primary control, the digital alarm inputs, as well as the reset inputs, are provided to allow the periodic exercising of the system to verify functionality.

### SYSTEM CONSIDERATIONS

The intent of the DR1920 is to provide protection from an overflow. To this end, the DR1920 should be made as independent of the normal working level control system as possible.

The Alarm Input of the DR1920 should be wired directly across the contacts that sense an emergency high level condition. If this is done, the only requirements for the DR1920 to be able to prevent the overflow is that it has primary power, the pumps can be started and the alarm switch closes as it should.

Because the DR1920 is only used for an emergency, it should be tested periodically to insure it is performing properly. A manual momentary pushbutton switch can be wired to the AUX Alarm Input and another can be wired to the RESET input to perform this testing.

Pushing the AUX Alarm switch until Pump 1 starts and then releasing it will exercise Timer 1, Timer 2, and Pump 1. The pump should stop when Timer 2 reaches its set time.

Pushing the AUX Alarm switch and holding it until Pump 1 and Pump 2 are running and then releasing it exercises Timer 1, Timer 2, Pump 1 and Pump 2. Since Timer 2 was tested in the first test, the Reset switch can be pushed to reset the timers and stop the pumps.

This testing can be performed by a PLC if due consideration is given to the tank level when testing is started and the potential problems that could occur if the PLC fails in a mode that creates a constant Alarm input or constant Reset input.

### SPECIFICATIONS

#### Alarm Inputs:

Impedance Input - NO or NC switch contact. Switch can be wired to other devices and still be monitored by the DR1920. To sense an "open" switch, the impedance across the switch must be 1500 ohms or greater at 20 KHz. To sense a "closed" switch, the impedance across the switch must be less than 500 ohms at 20 KHz. Will work with switch wired in series with 120VAC relays or in series with 12 or 24V DC relays. See Figure 2.

Auxiliary Input - Isolated switch or Open collector NPN transistor

Internal jumper may be selected for "Open" or "Close" to alarm. Jumper affects both inputs.

#### Reset Input:

Stops pumps and reset timers  
Requires isolated contact closure or open collector NPN transistor

#### Outputs:

Pump Control Relays - Two NO 10A (Form A) relay contacts

Discrete Outputs - Individual optically isolated NPN transistors conduct for Pump 1 and Pump 2 run.  
Sink or source - 30 mA

#### Timers:

Timer 1 - Pump 2 start delay.  
Adjustable 2 to 126 seconds (2.1 minutes) in 2 second increments

Timer 2 - Pump(s) Run Time (after alarm switch opens)  
Adjustable 5 to 1,275 seconds (21.25 minutes) in 5 second increments

Timers are set with binary coded DIP switches inside the enclosure

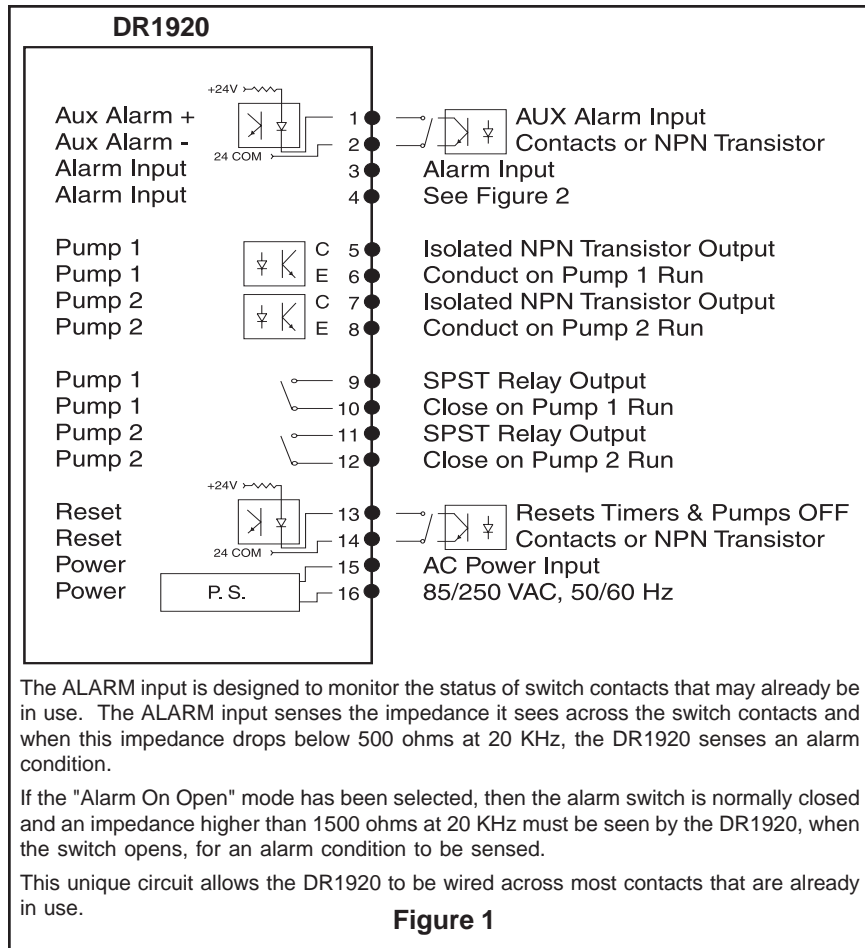
#### Indicators:

LED Indicators for -  
Pump 1, Green OFF, Red RUN  
Pump 2, Green OFF, Red RUN

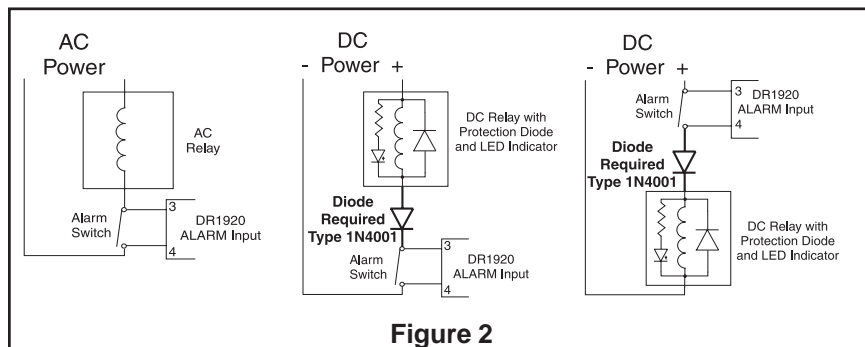
#### Power:

85/250 VAC  $\pm$ 10% 50/60 Hz, 2 VA

## WIRING



The circuit drawings below show how the DR1920 can be used to monitor contacts that are used to switch an AC relay and a DC relay with built in transient suppressor diode and LED status indicator.



## WARRANTY

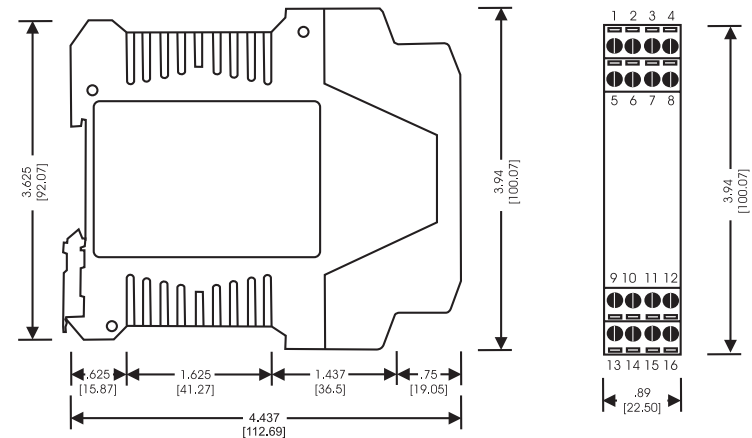
The DR1920 carries a limited 3 year warranty from the date of shipment. In the event of a failure due to defective material or workmanship, the unit will be repaired or replaced at no charge. Repairs will take place at the Wilkerson Instrument Company factory. In no event shall Wilkerson Instrument Company's responsibility exceed the original purchase price of the covered product.

The product covered by this warranty is warranted to perform to it's original specifications as published by Wilkerson Instrument Company. There is no warranty of merchantability or fitness for a particular purpose. This warranty excludes liability for any consequential damage that may accompany or follow a covered defect or failure. The warranty excludes damage from improper use, abuse, or operation contrary to instructions provided by Wilkerson Instrument Company.

## MOUNTING

The module mounts on a standard H-35 DIN rail. A spring latch holds it in place. The module is demounted by using a screw driver to release the latch. The latch is accessible at the bottom of the module.

## CASE DIMENSIONS INCHES [mm]



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