Microcomputer Triplex / Quadplex Relay

QPB

Operation

Initial application of power to the input terminals will flash the indicating LEDs for 2 seconds, but no loads will be energized. When #1 input switch closes, the appropriate load will be energized after 5 seconds. As additional input switches close, additional loads will be energized. The sequencing of the QPB becomes apparent when pump or pressure requirements are satisfied and input switches begin to open.

If all input switches are closed and all loads are energized, when #4 input switch opens, #1 load de-energizes. The QPB sequences the loads, distributing the running time, using a First On First Off (FOFO) basis. If two or more loads are to be turned on simultaneously, the QPB will activate one load, and wait 5 seconds before turning on the next load. This staggered starting prevents line surges.

Any of the loads can be taken out of service or future expansion loads can be disabled by turning off the appropriate Relay Select switch(s). The QPB will sequence the remaining loads, skipping the disabled load(s).

The Alarm contact will activate whenever an input switch closes out of sequence. If #2 Input switch closes, but #1 remains open (because of a failure), the Alarm contact will close and the QPB will operate two pumps as if #1 Input switch had closed. When the condition indicating a fault clears, the Alarm resets automatically.

With two Relay Select switches disabled, the QPB performs a true duplex alternating operation, even if two loads are activated each time.

- **4, 3 and 2 Pump Sequencing**
- **FOFO (First On / First Off)**
- **Removable Terminal Blocks**
- **Input De-Bounce Delay**
- **Staggered Starting**
- **Manual Output Select**
- **Alarm Output**
- **Indicating LEDs**
- **10 Amp,1NO**
- **Pick-up Delays**

c **UL** US   E71902 Standard 508

Specifications

Electrical
Line Voltage:
24V AC/DC, ±10%
115 or 230VAC, ±10%, 1Ø, 50/60Hz
Inputs: Normally Open (NO) contact or Solid State (NPN)
Power Up Delay: 5 Sec., Fixed
Input Delays: 5 Sec., Fixed
Output Ratings:
10 Amps Total Unit Rating
5 Amps @ 240VAC, per contact
10 Amps @ 120VAC, per contact
100,000 Full Load Electrical Cycles
10,000,000 Mechanical Cycles

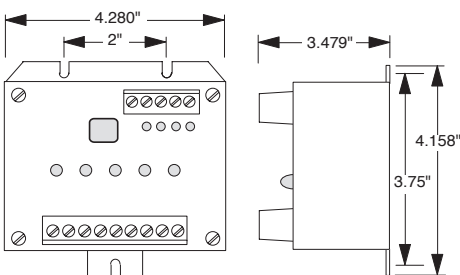**Output Delays:** 5 Sec., Fixed
Staggered start of multiple outputs

Physical
Mounting: Surface
Termination: Screw Terminals Removable (Plug-In)
Packaging: Dust Cover
Weight: 2 Lbs. Approx.

Ambient Temperatures
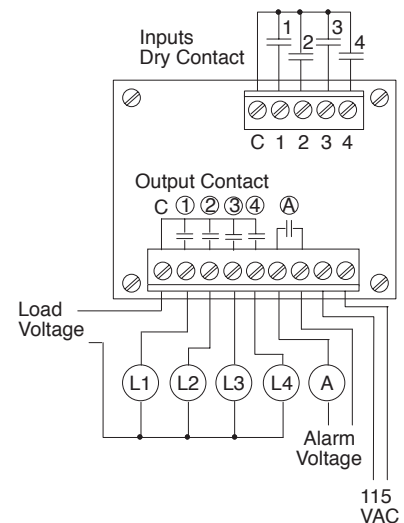**Operating:** 0°C to 40°C
Storage: -30°C to 85°C

Dimensions

4.280"
2"
3.479"
4.158"
3.75"

Ordering Information

QPB - 115A

R-K Model

Input Voltages
24V - 24VAC/DC
115A - 115VAC
230A - 208 to 230VAC

Connections

Inputs Dry Contact
1 2 3 4
C 1 2 3 4
Output Contact
C ① ② ③ ④ Ⓐ
Load Voltage
L1 L2 L3 L4 A
Alarm Voltage
115 VAC

Normal Operation

For normal operation where four loads (pumps or compressors) are available, but only three Input Switches are closed at any one time. When Input Switch #1 closes, Load #1 energizes 5 seconds later. When Input Switch #2 closes, Load #2 energizes 5 seconds later. When Input Switch #3 closes, Load #3 energizes 5 seconds later. When Input Switch #3 is opened, the FOFO operation is observed. Since Load #1 was the first one on, then it is the first one off. When Input Switch #3 re-closes, Load #4 is the next one in sequence to energize. FOFO operation insures that all active outputs are operated in sequence and distributes the running time between Loads.
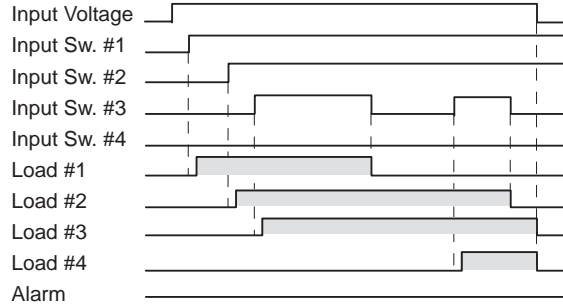
#3 Relay Select Disabled Operation

Where Load #3 (pump or compressor) has been taken out of service, but four Input Switches are still active. When Input Switch #1 closes, Load #1 energizes 5 seconds later. When Input Switch #2 closes, Load #2 energizes 5 seconds later. When Input Switch #3 closes, Load #4 energizes 5 seconds later since Load #3 has been disabled. When Input Switch #3 is opened, the FOFO operation is observed. Since Load #1 was the first one on, then it is the first one off. When Input Switch #3 re-closes, Load #1 now is the next one in sequence to energize. FOFO operation insures that all active Outputs are operated in sequence and distributes the running time between Loads.
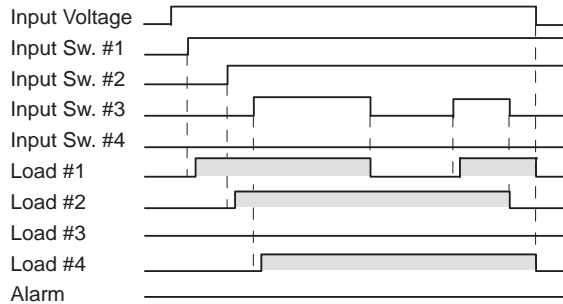
Engineering Specification Paragraph

Logic controller must be able to operate as a 2, 3 or 4 pump (compressor) sequencer using a First On First Off (FOFO) operation, relative to the number of starters being used. Any combination or quantity of outputs may be disabled, maintaining the FOFO operation. Time delays of 5 seconds are required to de-bounce each input signal, in addition to a 5 second staggered start if more than one output is called into service at one time.