DUPLEX Q CONTROL PANEL

1.01 GENERAL

A. Contractor shall furnish all labor, materials, equipment and incidentals required to provide duplex motor control panel as specified herein.

B. The motor control panel shall be assembled and tested by a shop meeting U.L. Standard 508 for industrial controls. The motor control panel shall be assembled and tested by the same manufacturer supplying the pump so as to insure suitability and assurance of experience in matching controls to motors and to insure single source responsibility for the equipment.

2.01 CONSTRUCTION

A. The controls for the pump shall be contained in a steel enclosure meeting NEMA 3R requirements with hinged door.

B. The enclosure shall have provisions for padlocking. A nameplate shall be permanently affixed to the panel and include the pump model number, voltage, phase, hertz, pump full load ampere rating and pump horsepower rating. A warning label against electric shock shall be permanently affixed to the outer door.

C. A steel back panel with electroplated bright zinc and clear chromate finish shall be provided. A painted steel back panel shall not be acceptable.

D. For each pump a run light and a hand-off-auto switch shall be provided. Run lights and hand-off-auto switches shall be mounted on an electroplated bright zinc with clear chromate finish steel bracket. The run lights and hand-off-auto switches shall be properly labeled as to function. The hand-off-auto switches shall be rocker type with an electrical life of 50,000 operations. The run lights shall match the hand-off auto switches in appearance and have an electrical life of 50,000 hours. Run lights shall be red.

E. The incoming power shall be _____ volts, _____ phase _____ hertz service. Thermal blocks with box type lugs shall be supplied to terminate all wiring for floats and heat and seal sensors for the pump, if required. The pump leads shall be terminated at the overload relay or at box type terminal blocks. The terminal blocks for the float connections shall be on the pump controller.

F. A circuit breaker shall be used to protect from line faults and to disconnect the pump from the incoming power. Circuit breakers shall be thermal magnetic and sized to meet NEC requirements for motor controls.

G. The magnetic starter shall include a contactor with a minimum mechanical life of 3,000,000 operations and a minimum contact life of 1,000,000 operations. Definite purpose contactors shall not be acceptable. The magnetic starter shall include an overload relay which is ambient temperature compensated and bimetallic. The overload relay shall be capable of being set in either a manual or automatic reset mode. In the manual mode, reset shall be accomplished only by the operator. At 6 times full load amps the overload relay shall trip within 10 seconds or Class 10 rated overload relays shall be required.

H. Control voltage shall be 120 VAC and may be accomplished by the means of a transformer or available line voltage. Control fuse(s) and on/off switch shall protect and isolate the control voltage from the line.

I. Wire ties shall be used to maintain panel wiring in neat bundles for maintenance and to prevent interference with operating devices. All wiring shall be color coded to facilitate maintenance and repair of the control panel. Where a color is repeated, number coding shall be added. A schematic shall be permanently attached to the inside surface of the front door.

J. All ground connections shall be made with ring tongue terminals and star washers to assure proper ground.

K. A duplex pump controller shall be provided for control logic. Pump controller shall be solid state utilizing a printed circuit board to avoid conventional wiring. The printed circuit board of the pump controller shall be made of U.L. listed materials.

L. The pump controller shall indicate float circuit operations utilizing red amber LED indicator lights. LED indicator lights shall provide adequate information so that they can be used for diagnosis in troubleshooting problems located in the float circuits. Each LED shall be permanently labeled on the pump controller as to function.

M. Pump controller shall have provisions for connecting float level controls and heat sensor monitors, where applicable, to box type lug connectors.

N. Box type lug connectors shall be made of polyamide thermoplastic to exclude aging due to heat influences. Phenolic type terminal blocks on the pump controller shall not be acceptable. Each terminal block shall be properly and permanently labeled on the pump controller as to its purpose.

O. Pump controller shall include alternating circuit of the low voltage type and be operational from a transformer mounted on the pump controller board. The alternator shall consist of an alternating relay which alternately switches when voltage is removed from its circuit. Alternating circuit shall have a totally isolated ground.

P. Wiring of hand-off-auto switches, run lights, contactors, and overloads to the pump controller shall be accomplished by means of plug connectors. The pump controller shall have male header assemblies from the corresponding devices on the pump controller for that male header assembly. Header assemblies shall be constructed of a corrosion-resistant thermoplastic material having a temperature range of -55°C to 105°C and copper alloy, bright acid tin over nickel plating contacts.

3.01 OPTIONS

A. Panel shall be equipped with the following additional features.

- U.L. 508, intrinsically safe circuit extensions for floats. (Standard construction only)
- U.L. 913 labeled with intrinsically safe circuit extensions for floats, heat sensor and seal sensor circuitry. (Explosion proof pumps only)
- High level alarm light (Flashing) (Non-Flashing)
- High level alarm horn with push to silence switch.
- Dry contacts for telemetry of alarm conditions
- Low water alarm
- Redundant off float switch
- Elapsed time meter (per pump)
- Seal failure light
- Anti-condensate heater (50 watt) with thermostat
- Heat sensor - manual reset
- Phase failure protection (3 phase only)
- Lead pump selector switch
- Lightning suppresser
- Lag pump on time delay (15-20 seconds)
- 24 hour time clock, adjustable to 15 minute intervals to control pump operation
- 120 volt convenience outlet
- Cycle counter
- Swing dead front door with non-fused disconnect (with fused disconnect)
- Nema 4x non-metalic enclosure
- Nema 4x stainless steel enclosure