

NOVUS 1000 PLUS CONTROL PANEL

1.01 GENERAL

- A. Contractor shall furnish all labor, materials, equipment, and incidentals required to provide (simplex, duplex, triplex) pump control panel as specified herein.
- B. The pump control panel shall be assembled and tested by a shop meeting U.L. standard 508A for industrial controls. Each control panel shall receive a factory test to ensure proper operation prior to shipment.
- C. A complete wiring diagram and installation instructions shall be provided.

2.01 ENCLOSURE

- A. The controls for the pump shall be contained in a durable NEMA 4X enclosure, made from polycarbonat material and intended for indoor or outdoor use primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water, and hose directed water.
- B. The enclosure shall be undamaged by the formation of ice. It shall also include a flame retardant so as to meet the flammability requirements of U.L. 94V-O. Heat distortion shall not occur until 350°F and the enclosure shall be resistant to ultraviolet light.
- C. The enclosure shall have a non-metallic hinged door with stainless steel latches that include provisions for padlocking. A nameplate shall be permanently affixed to the panel and include the voltage, phase, hertz, pump full load ampere rating, and pump horsepower rating. A warning label stating the power should be disconnected before servicing shall appear on the panel.
- D. The enclosure shall include a non-conductive, molded inner-door, which isolates the user from energized components and dangerous line voltage, while saving space and making the controls more easily accessible.
- E. A non-conductive, injected molding back panel shall be provided. The back panel shall have a raised platform for mounting circuit breakers, a heavy-duty parallel ground lug, a housing for motor contactors, and an elevated terminal strip, which provides installer friendly field installation.
- F. A quick disconnect circuit board shall be mounted on the back of the inner-door so as to provide easy replacement and troubleshooting. Spare fuses for alarm and control fuses shall be provided.

3.01 STANDARD CONTROL FEATURES

- A. The incoming power shall be (115, 208, 230, 460) volts, (single, three) phase (50, 60) hertz service. Terminal blocks with box type lugs shall be supplied to terminate all wiring for floats, heat sensors, and seal sensors for the pump, if required. The pump leads shall be terminated at box type terminal blocks.
- B. A circuit breaker shall be used to protect from line faults and to disconnect the pump(s) from the incoming power. Circuit breakers shall be thermal magnetic, sized to meet NEC requirements for motor controls, and accessible through the inner-door.
- C. All features shall be integrated on a single control board with scope for future expansion. The compactness of the control board shall eliminate the need for several discrete components resulting in ease of serviceability, reduction in probability of failure, and lower heat generation. The plug-ins feature of the control board shall enhance ease of serviceability by eliminating the need for all manual wiring. The control board shall operate on a low voltage DC as compared to the mains thereby making it inherently safe.
- D. For each pump a run light and a hand run pushbutton shall be provided. The run lights and hand run pushbuttons shall be properly labeled as to function. Run lights shall be green. Should the high level float or the redundant off float be triggered, the hand run pushbuttons become momentary contact and must be held down to maintain a closed position.
- E. **(HPGR/HPD)** The motor starter(s) shall be of the definite purpose type and shall provide electrical start/stop control for each pump. The coil shall have an operating voltage of 120 VAC.
- F. **(HPG)** The motor starter(s) shall be of the IEC rated type and shall provide electrical start/stop control for each pump along with overload protection. The coil shall have an operating voltage of 120 VAC.
- G. Control voltage shall be 120 VAC and may be accomplished by the means of a transformer should the input voltage be unable to produce a 120 VAC signal. Control fuse(s) and an on-off switch/circuit breaker shall protect and isolate the control voltage from the line.

- H. 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.
- I. A schematic shall be permanently attached to the inside surface of the front door.

4.01 **FLOAT SWITCH CONTROL OPERATION**

- A. The control panel shall provide terminal strip inputs for: pump off, pump on, lag on (duplex only), and alarm float controls.
- B. (Simplex) When the water level rises to the pump on float level, the pump shall turn on and lower the water level to the pump off float level. Should the water level reach the high water alarm level, a flashing red alarm light shall activate and an audible alarm shall sound.
- C. (Duplex) When the water level rises to the lead pump on float level, the lead pump shall turn on and lower the water level to the pump off float level. Should the water level reach the lag pump on float level, both pumps shall operate. If the water level reaches the high level alarm float level, a flashing red alarm light shall activate and an audible alarm shall sound..
- D. (Simplex/Duplex) Should there be a redundant off float and the pump continues to operate after the water has reached the pump off float level, the pumps shall be locked out, the flashing red alarm light shall activate, and the audible alarm shall sound. (Redundant off optional)
- E. The controller shall provide float switch status indicator lights. The indicator LEDs shall activate to indicate the closure of each of the float switches, and shall flash to indicate float switch failure. The out-of-sequence or float failure indicators shall remain activated until the next pump down sequence after the fault has been corrected. A chirping audible alarm shall also be activated when a float switch failure or out-of-sequence operation is detected.

5.01 **ALARM / INDICATORS / MISC**

- A. Panel shall include a top-mounted, high intensity, flashing red alarm light.
- B. Panel shall include an audible piezo alarm, +/- 95dB within 2', with a side mounted touch-to-silence pad and circuitry as a standard feature. Optional horn or bell are available.
- C. **(HPG only)** Panel shall provide a means for connecting the seal failure probe(s) from the pump. The panel shall incorporate a seal failure warning light that provides a visual indication of moisture entry into the motor. The seal failure circuitry shall not stop the pump.
- D. **(HPG only)** Panel shall provide a means for connecting the motor heat sensor from the pump. The heat sensor shall be wired in series with the motor contactor coil to disable the circuit should an overheat condition exist.
- E. Panel shall have individual fuses for the control and alarm circuits. Spare fuses shall be provided and mounted on the inner-door. Each fuse shall have a fuse blown indicator light for simple troubleshooting.
- F. Panel shall have the ability to add (by plug-in) the Digital Display center capable of providing an elapsed time meter, cycle counter, and making available a time dosing option for both simplex and duplex systems.
- G. An optional alarm circuit breaker can be provided to protect the 120v alarm circuit and shall be accessible through the inner-door. In addition, an auxiliary alarm contact can be provided for remote alarm applications.