

2HP Residential Grinder Pump Rail System Package

Basin Assembly

Technical Specifications

The manufacturer shall furnish and deliver fully assembled grinder pump stations to the contractor or owner. Simplex units, containing one grinder pump and all necessary parts and equipment, shall be installed in fiberglass reinforced polyester tanks for outside installation. All equipment shall be factory installed, except for externally mounted control panel, gravity sewer inlet hubs and pump assembly, which are to be installed in the field.

Each pre-assembled simplex station shall include the basin, basin cover, grinder pump and motor, quick disconnect rail system, check valve, junction box, start-stop level controls, motor high temperature shutoff, motor seal leak alarm, high water alarm, all internal wiring terminating into the junction box, shutoff valve and Schedule 80 PVC discharge piping. In addition, an external alarm and pump control panel is to be provided for each unit.

1. Basin

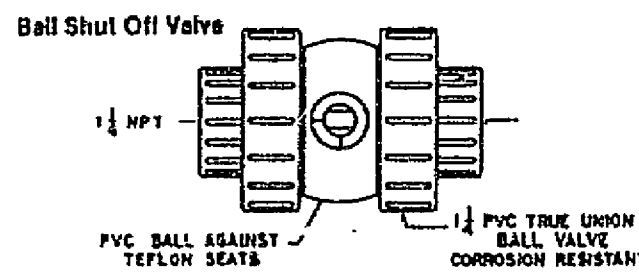
The basin shall be 36" diameter with depth as shown on the plans. The basin shall be molded of fiberglass reinforced polyester resin manufactured by the lay-up and spray technique to assure that the interior surface is smooth and resin rich. The basin shall have a minimum wall thickness of 1/4 inch. A steel anti-floatation plate shall be molded into the bottom of the basin.

2. Basin Cover

The cover shall be of 3/4" polypropylene. The cover shall be bolted to the basin with stainless steel cap screws. Cadmium plated nuts for the screws shall be embedded in the fiberglass to prevent turning and for corrosion resistance.

3. Shutoff Valve

A PVC true union ball type shutoff valve with teflon seats shall be furnished and installed in the discharge piping, as shown on the plans. If the discharge depth is more than 2 feet from the surface, a handle extension shall be supplied.



4. Rail Assembly

All guides, brackets and hold-downs will be of non-sparking, corrosion resistant structural plastic.

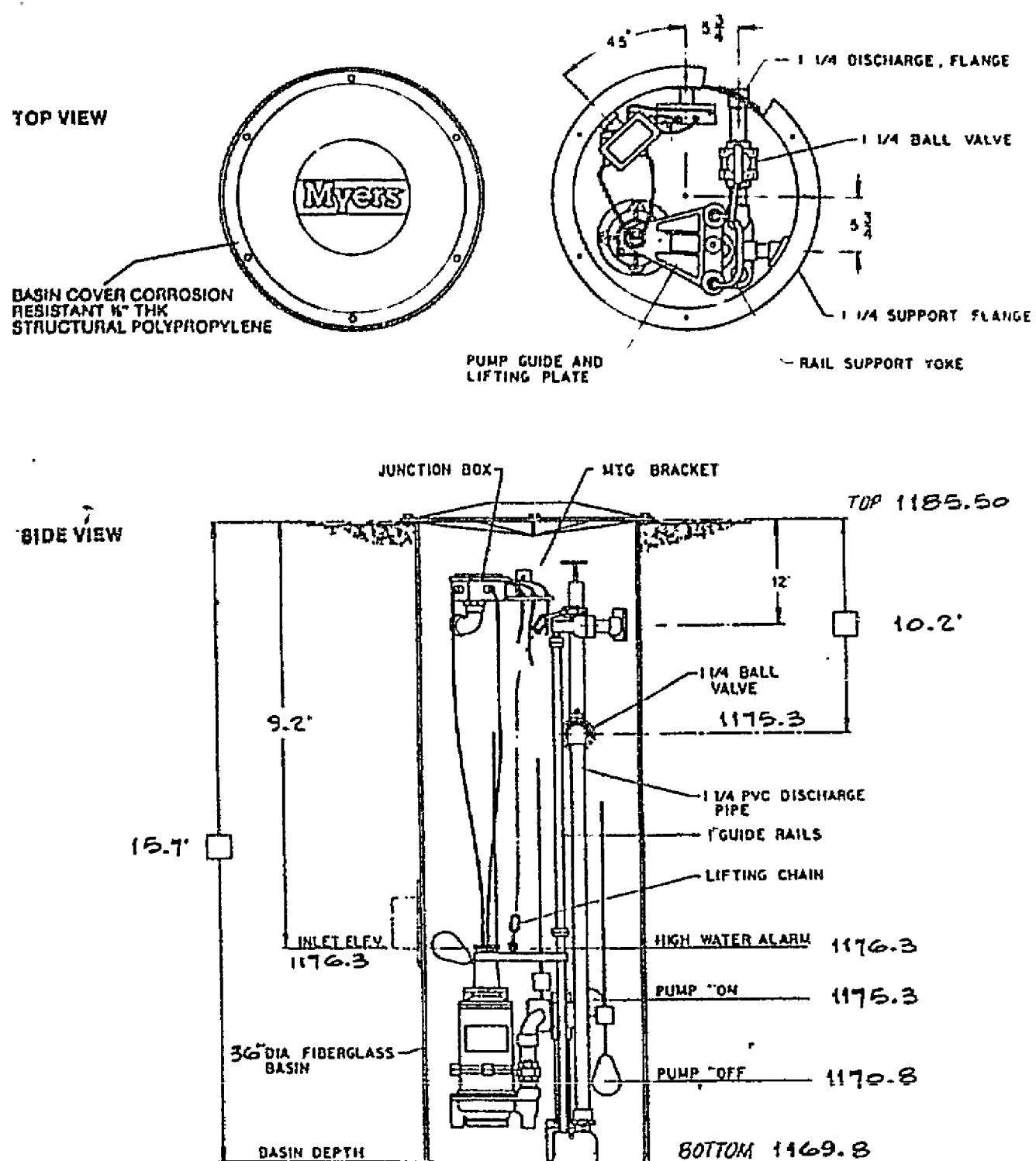
A lift-out guide rail assembly shall permit easy removal and installation of the pump and lower check valve without the necessity of personnel entering the basin. Structural guide brackets with guide yokes of sufficient bearing strength to prevent binding shall bolt to the pump. The yokes shall mate over guide rails of a minimum of 1 inch fiberglass pipe running between an upper rail support and the discharge case.

A lower discharge nozzle, downstream from the check valve, shall be guided into a chambered cavity in the discharge case. A shoulder on the nozzle shall bottom on the discharge case when the pump is properly located and shims shall not be required to insure alignment for a leak tight seal. Dual "O" rings shall effect a hydraulic seal around the nozzle when it is in its operating position. A brace, easily removable from the top of the basin, shall be provided to lock the parts together, preventing line surges from breaking the seal and allowing leakage. The discharge case shall have a discharge opening with piping to a coupling through the basin wall.

The discharge case shall be securely bolted to the basin floor and arranged in such a way that slight deflection caused by the discharge pipe will not cause the quick-connect pump flange to leak.

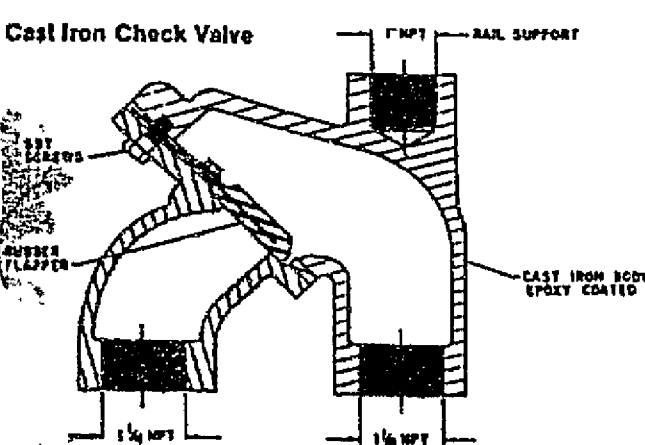
A lifting chain shall be securely fastened to the top of the pump and to the top of the basin to facilitate removal of the pump. The chain shall be minimum of 1/2" welded link type, or of adequate strength, required to effectively support the weight of the pump assembly while removing and installing.

Basin Assembly Top View & Side View



5. Piping

Schedule 80 PVC discharge piping shall connect to the stationary discharge base lift assembly and terminate at a 1 1/2" discharge flange mounted on the basin at the height shown on the drawing.



6. Check Valve

A heavy duty spring loaded all rubber flapper type check valve with cast iron body shall be an integral part of the discharge seat assembly and shall lift out with the pump assembly. The valve design shall be such to allow for operation when negative heads, of up to 5 feet, are encountered. The valve shall be designed to operate at all pressures in the sewer system created by the grinder pumps.

A flat stainless steel spring, integrally molded into the Buna N rubber flapper, shall be fastened into the Buna N rubber flapper in the check valve. All fasteners shall be stainless steel.

7. Inlet Flange

A basin inlet flange for 4" SCH 40 plastic pipe shall be included, but not mounted on the basin. The flange is to be mounted in the field at inlet height required by the installation, or as shown on the drawing.

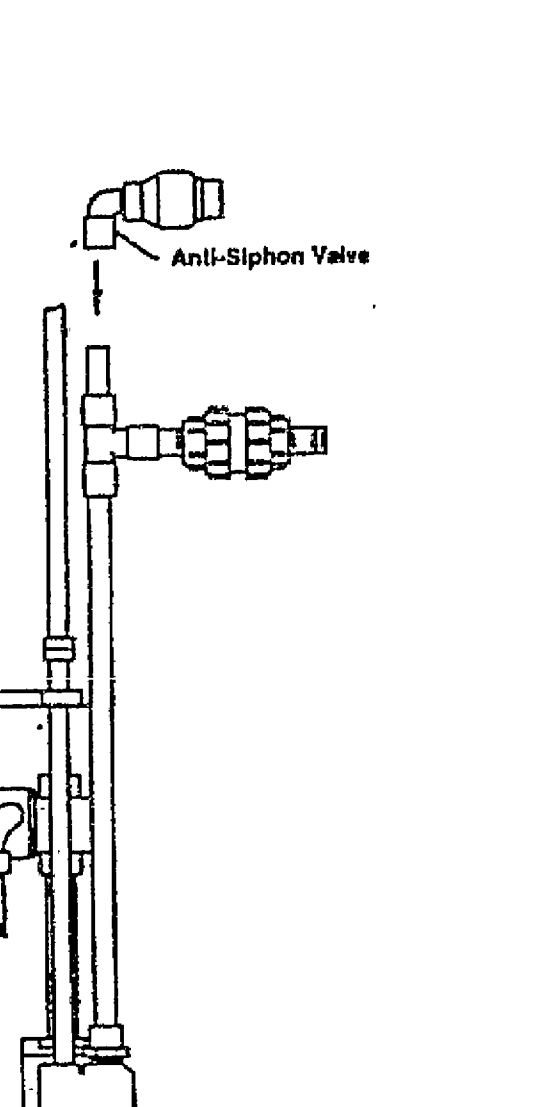
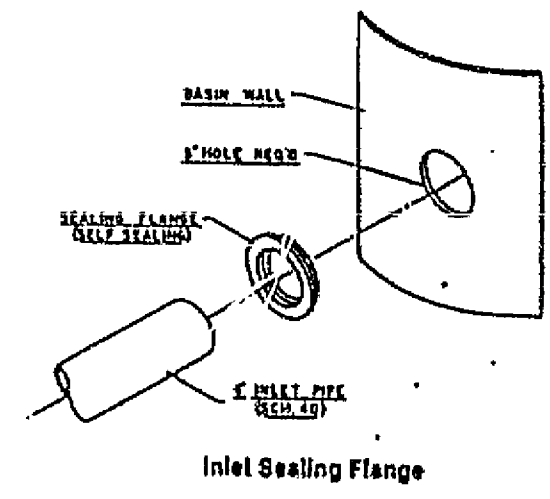
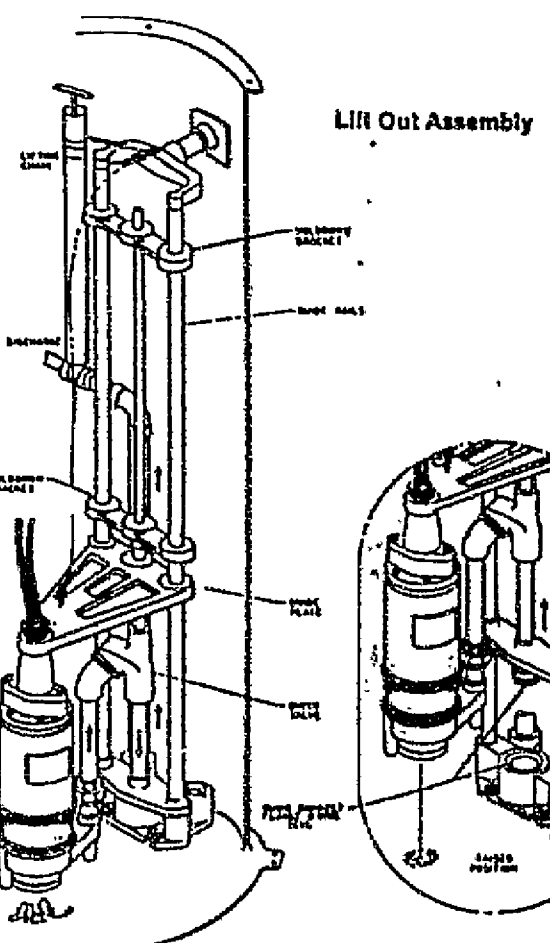
8. Anti-Siphon Valve

The basin assembly shall be arranged for easy acceptance of an anti-siphon valve in the field when required.

A 1/2" pipe shall extend from the pump discharge between the check valve and the gate valve to within two feet of the surface of the basin. The pipe shall be capped.

An anti-siphon valve kit shall be supplied to be installed on the riser pipe. The valve assembly shall include all materials required to complete the assembly.

The anti-siphon valve shall mount horizontally, shall be made of PVC and will not interfere with pump removal or installation.



Grinder Pump

Technical Specifications

1. Operating Conditions

WG 20-21 1/2 HP GRINDER PUMP WILL OPERATE @ 21 GPM VS 54 FT TDH

2. Pump

The pump shall have an integrally built in grinder unit and submersible type motor. The pump shall be suspended in the basin by two (2) 1" guide rails and quick disconnect lift out mounting assembly. Solids shall be fed in an up-flow direction to the grinder mechanism with no obstructions below the grinder inlet.

The grinder unit shall be capable of cutting such as wood, plastic, glass, rubber, sanitary napkins, disposable diapers and party hose into a fine slurry that will pass freely through the pump, service line and force main.

3. Motor

The motor pump shall be of the submersible type rated for 2 horsepower at 3450 RPM. Motor shall be single phase, 230 volt, 60 Hertz. Single phase motors shall be of the capacitor start-capacitor run type for high starting torque.

The stator winding shall be the open type with Class A insulation rated for 105°C, maximum operating temperature. The winding housing will be filled with clean dielectric oil that will lubricate bearings, seals and transfer heat from the windings to the outer shell. The motor stator is to be pressed into the motor housing for optimum concentricity and alignment, and maximum heat transfer. The motor shall be capable of operating over full range of performance curve without overloading motor and causing any objectional noise or vibration.

The motor shall have two bearings to support the rotor; an upper ball bearing to accommodate thrust loads and a lower ball bearing to take radial loads. Ball bearings shall be designed for a LB-10 life (50,000 hours).

A heat sensor thermostat and overload shall be attached to the top end of the motor windings and shall stop the motor if the motor winding temperature reaches 200°F. The high temperature shutoff will cause the pump to cease operation, should a control failure cause the pump to run in a dry well condition. The thermostat shall reset automatically when the motor cools to a safe operating temperature.

4. Power Cord

The motor power cord shall be 14-5 SOW/SOW-A and shall be fastened by means of a cord grip in the top of the pump. The top of the pump shall contain a waterproof junction box which will provide space to connect the power cord to the motor leads. The motor leads shall seal between the motor housing and junction box by means of a rubber compression fitting around each wire.

5. Seal Chamber

The motor shall be protected by two (2) rotary shaft seals mounted in tandem with an oil filled chamber separating the seals. The seals shall have carbon and ceramic seal faces diamond lapped to a tolerance of one light band. Metal parts and springs for seals shall be stainless steel. An electrical sensing probe shall be mounted in the seal chamber to detect any water leakage past the lower seal.

6. Pump Impeller

The pump impeller shall be of the recessed type to provide an open unobstructed passage through the volute for the ground solids. The impeller shall be constructed of cast iron and shall have pump out vanes on the back side of the impeller to keep solids from lower seal and reduce pressure at the seal faces. Impeller shall be threaded onto the stainless steel shaft.

7. Grinder Assembly & Construction

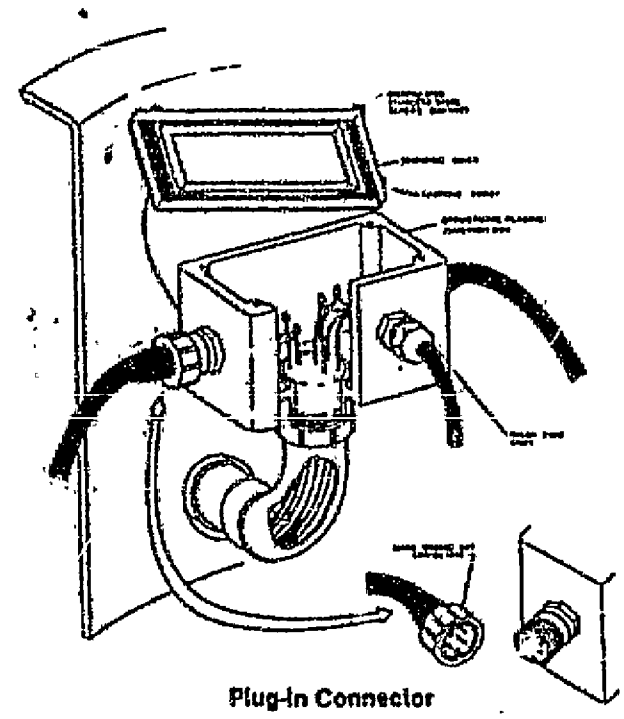
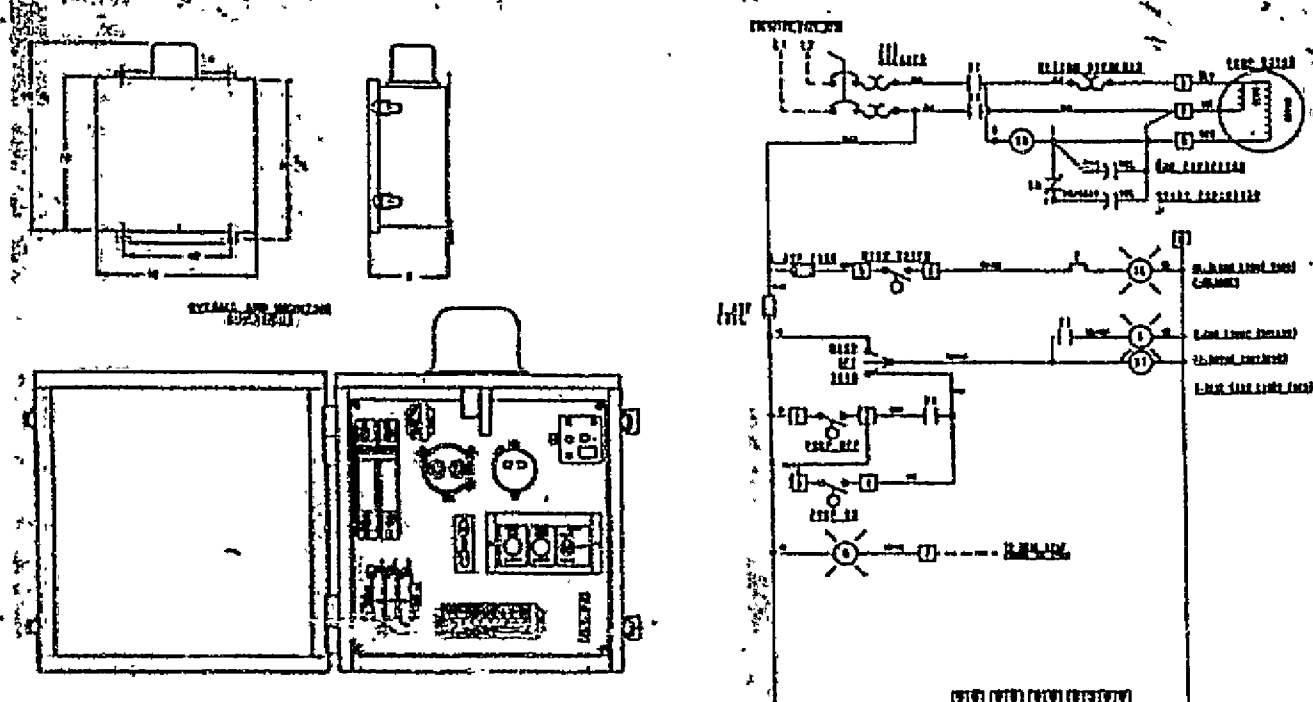
The grinder assembly shall consist of a rotating radial cutter and a stationary shredding ring, and shall be mounted directly below the volute passage. The rotating cutter shall be threaded onto the stainless steel shaft and shall be locked with a screw and washer. The stationary shredding ring shall be pressed onto an iron holding flange for easy removal. The flange shall be provided with tapped back-off holes so that screws can be used to push the shredding ring from the housing. Both the radial cutter and shredding ring shall be removable from the outside without dismantling pump. Grinder assembly shall be of such construction that no clearance adjustments are required when assembling. All grinding of solids shall be from the action of the radial cutter against the shredding ring. The radial cutter and shredding ring shall be of #440 stainless steel hardened to 58-60 Rockwell C.

8. Pump & Motor Castings

All iron casting shall be of high tensile cast iron and shall be properly cleaned, pre-treated with chromic rinse, and painted with a high quality enamel paint. All pump components that are not cast iron or stainless steel shall be galvanized or painted with baked-on epoxy. Fasteners shall be #302 stainless steel.

Electrical

2HP 230V 1Ø Control Panel



2HP 230V 1Ø Schematic Diagram

Plug-in Connector

A waterproof male plug shall be supplied on the pump power and control cord and shall mate to a female socket mounted in the junction box. The plug and cord shall be of the proper size to handle the voltage and current requirements of the pump.

The plug and receptacle shall be of the molded to cable and double face design. The female half shall fit like a cork into the flexible shroud portion of the male. In addition, individual neoprene shoulders around contacts shall fit into recesses in female section.

The cable shall be neoprene molded, one-piece design, and the connector shall have threaded coupling for positive tight connection and quick release. The mating connectors shall have an indexing tab to insure proper alignment.

Electrical

Technical Specifications

Control Panel

A NEMA 4X fiberglass control panel shall be furnished with each pumping unit to be installed, as shown on the plans.

The control panel enclosure shall be 14 1/2" x 12 1/2" x 5 1/2" (internal dimensions) and molded of reinforced polyester resins which are chemically resistant to corrosive atmospheres. The resin system shall be pigmented to impart a gray color to the enclosure and be resistant to ultraviolet light.

The resin system also shall include a flame retardant to obtain a flameability rating which meets UL 94V-0. Heat distortion temperature shall be 350 degrees Fahrenheit.

The enclosure shall be of one-piece, weather-proof construction with smooth, rounded corners and shall be constructed to have a smooth exterior and interior. The enclosure shall be fitted with a closed-cell neoprene gasketed cover. The enclosure shall be provided with back panel mounting provisions.

The cover shall be hinged with a heavy-duty corrosion resistant stainless steel piano hinge. The cover shall be lockable by means of two (2) high quality combination stainless steel latches and padlock hasps.

The enclosure shall be provided with external mounting feet on the top and bottom of the enclosure. These mounting feet shall be of fiberglass and molded as an integral part of the enclosure.

The back panel shall be a minimum of .060" aluminum and held in place by four (4) #10 screws, which will mate to four (4) threaded standoffs, which are molded into the enclosure.

The panel shall include a double pole 20 amp main disconnect breaker, alarm circuit fuse, reset control circuit fuse, I.E.C. rated motor controller, Kilovac overload, pump hand-off auto switch (momentary in the hand position), pump run light, seal leak light, start and run capacitors, relay, terminal blocks, ground lug (rated for 8GA to 14GA wire), and all necessary wiring and brackets.

The control panel shall be fitted with a red lexan (polycarbonate) alarm light. The light shall be approximately 3" high by 3 1/2" diameter. The globe shall be mounted on top of the enclosure with a neoprene gasket. The lens cannot be removed from the exterior of the enclosure. The lens may be removed by entering the interior of the enclosure and removing four (4) #8 screws. The bulb shall be 40 watt minimum high intensity medium base type. The bulb shall be easily replaced by removing a thumb screw from the support bracket on the interior of the panel.

The alarm shall have a bright glow and flash during high water conditions. The alarm light will go out when the water level drops.

All internal wiring shall be neat and color-coded. Each wire shall be of a different color or stripe (except for ground), and all incoming wires shall terminate into a box clamp type terminal block (except incoming power). All wires shall be 14GA type TEW rated for 105 degrees Celsius.

A schematic diagram (showing wire color) shall be permanently fastened to the inside of the enclosure. An installation and Service Manual shall also be included with each control panel.

The control panel shall be U.L. listed as an assembly.

Junction Box

The junction box shall be constructed of structural plastic for corrosion resistance, stability and mechanical strength. The enclosure shall be of adequate thickness and properly reinforced to provide good mechanical strength. The junction box shall have a fully gasketed cover that is held in place by four (4) captive stainless steel screws that can not be removed from the cover, with heads totally encapsulated so that no metal parts are exposed. The screw heads shall be of adequate size so that they may easily be installed and removed without the use of special tools. The cover shall be fastened to the main body of the junction box by means of totally corrosion-resistant talbar to prevent dropping the cover into the basin during service.

An adequate number of sealing-type cord grips shall be supplied for incoming pump and switch cords. The cord grips shall be made of non-corrosive material, such as PVC or nylon, and shall make an effective seal around the wire gasket. The cord grip shall also seal to the junction box wall with an "O" ring, gasket, or other effective means.

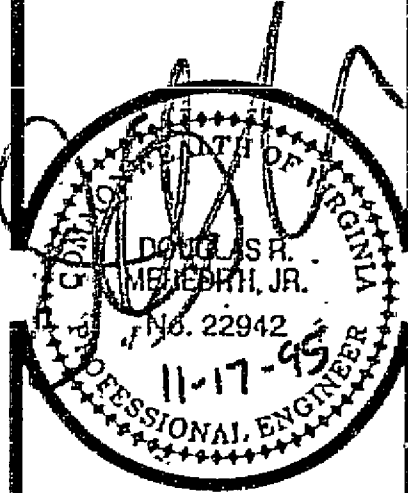
The junction box shall have a PVC solvent weld socket type conduit hub mounted in the bottom of the enclosure. The hub shall be of a corrosion resistant material and shall be of adequate size to accommodate the number of wires required to operate the pump.

The incoming wires shall be sealed by an external EYS type seal-off, (supplied by others), so that condensation from the conduit or groundwater will not enter the enclosure. The interior of the enclosure shall be of adequate size to accommodate the wires and connections required to operate the pump.

The wires running between the control panel and the junction box shall be color-coded and fastened to the pump and switch controls by means of adequately sized and insulated twist lock or crimp connectors.

The junction box shall be designed to NEMA 6 standards for occasional submergence.

HONEYCUTT VETERINARIAN CLINIC
PUMP STATION DETAILS



COMMISSION
605
SHEET
C6

NO. C6 OF C9

RC-616B