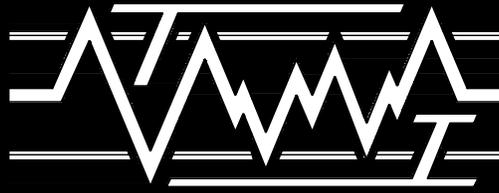


*VARIOUS  
TECHNOLOGIES  
INCORPORATED*



**Komand-O-Lot™**

*DUPLEX DUAL CONTAINMENT PUMP STATION*

*SAMPLE SPECIFICATIONS*

*SERIES NUMBER PS-4*



*High Quality Sets Our Standards™*

*VARIOUS TECHNOLOGIES INCORPORATED  
2720 AIELLO DRIVE , BUILDINGS C/D , SAN JOSE, CA 95111  
TELEPHONE (408)972-4460 FAX (408)972-4125*

**DUPLEX DUAL CONTAINMENT PUMP STATION SAMPLE SPEC PS4VTI**  
**WASTEWATER LIFT STATION - SECTION 1 -**

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

A. Furnish a complete, ready to install, factory tested, duplex dual containment pump station as specified herein.

**1.02 QUALITY ASSURANCE**

A. The products under this section shall be supplied and manufactured by a single manufacturer who has been regularly engaged in the design and manufacture of pump stations, liquid level controls, and custom control panels for at least 5 years.

B. The pump station shall be cycle tested to insure error free operation. If the unit does not pass the factory test the manufacturer shall correct the defect and retest the pump station until operation testing is satisfactorily completed.

C. The manufacturer shall warranty the pump station for a period of 1 year.

**1.03 SUBMITTALS**

A. Shop drawings: Furnish shop drawings for review and final comments prior to manufacturing the pump station. The following data will be considered sufficient data to show that the pump station conforms to the specification:

1. Drawing of the pump station showing the inlet location, discharge location, and vent location.
2. Drawing showing pump station tank and overall dimensional data.
3. Liquid level controller data with set points.
4. Pump performance curves.
5. Factory warranty.

B. Manuals: Furnish 4 copies of bound manufacturer's installation and operation manuals with the finished pump station. The manuals are to include the following.

**DUPLEX DUAL CONTAINMENT PUMP STATION SAMPLE SPEC PS4VTI**  
**WASTEWATER LIFT STATION - SECTION 1 -**

1. Operation of station and associated optional features.
2. Pump performance curves.
3. Maintenance procedures for pump and liquid level controller removal.
4. Level controller data sheets.
5. Pump parts manual and data sheets.
6. Installation and start-up procedures.
7. Electrical JIC system schematics and panel schematics.

PART 2 - PUMP STATION DETAILS

2.01 GENERAL

A. Overview: The lift station shall be a completely factory assembled, weatherproof, watertight, package. The package shall include a primary liquid storage tank, a secondary liquid containment tank, 2 sump pumps, 2 latching liquid level controllers (1 for each pump for redundancy and electrically independent pump control), a horizontal level switch for monitoring the annular space between the primary and secondary tanks, *and a control panel*. The station provides necessary accessories for a complete operating unit with single point electrical power connections. The station shall contain the manufacturer's label containing the station's part number, indicating the manufacturing date, station's voltage, station's current, liquid level controller set points. Additional features are to be included as under major components.

B. The pump station shall be manufactured by Various Technologies Incorporated, 2720 Aiello Drive, San Jose, California. Part number PS-4\_\_-\_\_\_\_.

C. Operation: The primary function of the lift station is to collect the liquid below drainage grade and pump the liquid up to an above ground system. This system operates automatically by making use of two liquid level controllers containing a high and a low latching set point *and one with a high high alarm switch*. The first liquid level controller's (the stage 1 controller) high latching set point is used to turn the lead pump "ON". The low latching set point is used to turn the lead pump off. As the liquid level reaches the high latching point, the float, containing specially oriented magnets, trips the latching liquid level controller, turning the pump ON. As the pump empties the tank, the float lowers on the column until reaching the low latching set point, which turns the pump OFF. The second liquid level controller (the stage 2 controller is used to control the lag pump. This controller operates the same as first controller except that

**DUPLEX DUAL CONTAINMENT PUMP STATION SAMPLE SPEC PS4VTI**  
**WASTEWATER LIFT STATION - SECTION 1 -**

the high level pump "ON" set point is set slightly higher than the first. When an over capacity or lead pump failure occurs, the lag pump shall activate increasing the discharge rate up to twice that of the lead pump.

*A sequencing circuit shall alternate the lead-lag pumps after the end of each lead pump down cycle as to provide even cycling times for each pump. The sequencing circuit shall not prevent the system redundancy specified herein. The alarm will activate when the liquid level raises the float to the high level alarm set point. The switch will remain activated due to a stop ring pinning the float at this point. Hence, the alarm switch will trigger when the liquid level is at or above this point.* The dual containment level switch is installed in a normally open configuration and closes if liquid is present at or above the switch location.

**2.02 MAJOR COMPONENTS**

A. Tanks: The lift station tanks shall be constructed of white polypropylene with welded joints. The tank walls shall be manufactured out of 1/2" thick material. *The secondary containment tank shall have external support steel ribbing encapsulated in polypropylene. The primary tank shall have an internal integral strainer support. (provided on tanks deeper than 20" and with sides longer than 36").* The primary tank shall include an internal flow turbulence damper designed to prevent incoming liquid from aerating and causing pump impeller cavitation. The inlet will be a 1 and 1/2" female threaded polypropylene fitting welded on the inside and outside of the primary tank wall. The secondary tank shall contain a watertight 1 and 1/2" compression fitting to facilitate the inlet pipe's installation directly into the primary tank inlet fitting. The tank cover, primary tank, and secondary tank will be sandwiched together as to provide watertight primary and secondary tank cavities. This sandwich tank design shall include a mechanical joining of the tank components to prevent the primary tank from lifting out of the secondary tank due to buoyancy effects encountered when the secondary tank contains liquid. *To facilitates floor anchoring an additional plate will be added to the bottom of tank and extend out from the base of the secondary tank by 2" on each side.*

OD base dimensions of the primary tank shall be \_\_\_" x \_\_\_" x \_\_\_".

The total primary tank volume is \_\_\_\_\_ U.S. gallons.

OD base dimensions of the secondary tank shall be \_\_\_" x \_\_\_" x \_\_\_".

*(The secondary tank is 4" larger than the primary tank. The optional floor anchoring plate adds 4" more.)*

The primary tank cover and pump mounting plates shall be constructed to allow for removal of the entire pump assembly. The tank cover shall be fastened to the tanks with 304 stainless steel bolts and nuts. The pump platforms and all other fasteners that are tapped into the cover, and penetrate into the tank cavity, shall be 316 stainless steel

**DUPLEX DUAL CONTAINMENT PUMP STATION SAMPLE SPEC PS4VTI**  
**WASTEWATER LIFT STATION - SECTION 1 -**

bolts. The cover, primary tank, and the secondary tank shall be wet set silicone sealed to insure a water tight seal. The pump platforms and the liquid level controllers shall be sealed to the tank cover via an O-ring seal. Discharge piping penetrations on the pump platforms shall be made with compression bushing that allows for quick removal of the pumps while maintain watertight integrity. A 1-1/2" vent will be FNPT tapped into the tank cover and a 1-1/2" thread by thread street elbow provided. All fittings with threaded connections will be silicone sealed during the manufacturing of the station.

*The tank cover shall contain a 6" drip berm, on the outer edge of the cover, with four 1" diameter drainage secondary through holes located in each corner of the top cover. The holes will penetrate through the cover, primary tank flange, into the secondary tank's annular space. The primary tank cavity shall remain watertight. The secondary tank cavity will be open to atmosphere through the 4 drip drainage holes.*

B. Pump: The pump shall be of a seal-less design (such as a Filter Pump Industries Penguin P or HP series pumps) or equal. The pumps are to be mounted vertically. The pumps shall have a PVC spring suction check valves, *CPVC weighted flapper suction check valves, polypropylene ball suction check valves, or PVDF ball suction check valves*, on tanks with a depth of 18" and deeper. The pumps shall have a PVC diaphragm discharge check valves, *CPVC weighted flapper discharge check valves, polypropylene ball discharge check valves, or PVDF ball discharge check valves*, with Viton, *EP, or Buna*, trim and discharge check valve. The pump piping and fittings shall match the check valve body material specified above. Penetrations of the pump discharge pipe shall be compression bushing sealed to the mounting plate as to achieve a watertight seal. Pump motor shall be epoxy coated TEFC with drip cover. Pump wet ends shall be CPVC, *natural unfilled Polypropylene, or PVDF*.

Each pump shall be capable of \_\_\_ GPM at \_\_\_ TDH.  
Pump size and voltage \_\_\_hp \_\_\_VAC \_\_\_ phase 60hz.

C. Liquid Level Control: Controllers shall include the following features; all plastic construction. The wet ends shall be polypropylene *or PVDF* material, power interrupt pump down reset, pump down ground default interrupt, and latching control for the pump circuits. *The stage 1 controller shall have an electrically independent alarm high level switch capable of switch a 12Va load as provide on the LC-91 (a redundant high level switch float as provided on the (LC-92) for alarm switch, PVC/EP O-ring sealed mounting flange. Set points to be located for the alarm switch to be at 2" (or \_\_\_") from the top of the tank. The lead pump "ON" set point shall be located at 2" ,5" (or \_\_\_") from the top of the tank. The lead pump "OFF" set point shall be located at 3" (or \_\_\_") from the bottom of the tank. The lag pump "ON" set point shall be located at 3" , 4" (or \_\_\_") from the top of the tank. The lag pump "OFF" set point shall be located at 3" (or \_\_\_") from the bottom of the tank. Various Technologies Inc. Komand-O-Lot™ Part number as follows:*

**DUPLEX DUAL CONTAINMENT PUMP STATION SAMPLE SPEC PS4VTI**  
**WASTEWATER LIFT STATION - SECTION 1 -**

Stage 1 Controller (lead Pump)

LC-90P-OG20 with set points of \_\_\_H, \_\_\_L, \_\_\_OVL.

*LC-91P-OG20 with set points of \_\_\_HH, \_\_\_H, \_\_\_L, \_\_\_OVL.*

*LC-92P-OG20 with set points of \_\_\_HH, \_\_\_H, \_\_\_L, \_\_\_OVL.*

LC-90F-OG10 with set points of \_\_\_H, \_\_\_L, \_\_\_OVL.

*LC-91F-OG10 with set points of \_\_\_HH, \_\_\_H, \_\_\_L, \_\_\_OVL.*

*LC-92F-OG10 with set points of \_\_\_HH, \_\_\_H, \_\_\_L, \_\_\_OVL.*

Stage 2 Controller (lag Pump)

LC-90P-OG20 with set points of \_\_\_H, \_\_\_L, \_\_\_OVL.

*LC-91P-OG20 with set points of \_\_\_HH, \_\_\_H, \_\_\_L, \_\_\_OVL.*

*LC-92P-OG20 with set points of \_\_\_HH, \_\_\_H, \_\_\_L, \_\_\_OVL.*

LC-90F-OG10 with set points of \_\_\_H, \_\_\_L, \_\_\_OVL.

*LC-91F-OG10 with set points of \_\_\_HH, \_\_\_H, \_\_\_L, \_\_\_OVL.*

*LC-92F-OG10 with set points of \_\_\_HH, \_\_\_H, \_\_\_L, \_\_\_OVL.*

The horizontal liquid level switch used to monitor the secondary containment space shall be capable of switching 12Va or 10 Watts. The switch shall be of natural Polypropylene construction and incorporated the Komand-O-Lot™ micro latch features.

D. Control Panel: The panel enclosure shall be a UL listed NEMA 4X hinged enclosure. The components within the panel must be UL or UR listed and shall be built to conform to the National Electrical Codes (N.E.C.). Factory color coded wires, and labeled terminal bars as to allow for single point electrical connections to house power. All connections to the panel and conduit must conform to Nema 4 and N.E.C. standards. The panel shall contain 2 motor starters that consists of a thermal overload relays with bimetallic heaters matched to the pump motor loads. The motor contactors shall be a heavy duty hermetically seal mercury displacement type relays with maximum motor rating published on the relay housings. The relays shall not require contact replacements.

Circuit breakers, fusing, and or safety disconnect switch for the pump station will be provided by the contractor to meet local, state, and national building codes.

The panel will be station mounted to the pump mounting bracket. All connection to the station from the control panel will be made at the factory and tested as specified herein. *The panel will be remote mounted. The manufacture will test the panel and pump station as a single unit, but will not make conduit penetration into the enclosure. The contractor will be responsible for making these connections after locating the panel remotely.*

*Panel Options (all optional lights and switches will contain acid etched engraved integral name plates)*

**DUPLEX DUAL CONTAINMENT PUMP STATION SAMPLE SPEC PS4VTI**  
**WASTEWATER LIFT STATION - SECTION 1 -**

1. *Provide a high level alarm light*
2. *Provide a high level alarm light and a dual containment alarm light*
3. *Provide a high level alarm light and a dual containment alarm light with 83 db pulsing audible alarm.*
4. *Provide a high level alarm light and a dual containment alarm light with 83 db pulsing audible alarm and an alarm silence button.*
5. *Provide a pump running lights.*
6. *Provide dry contacts for high liquid level alarm and dual containment alarm.*
7. *Provide a Hand-Off-Auto (HOA) switch for manual control of the pump. Hand position turns the pump "ON". Off position shuts the pump "OFF". Auto position allows the liquid level controller to operate the pump automatically.*
8. *Provide a Main Safety disconnect Switch with fusing built into the control panel.*
9. *Provide a fused step down control transform to provide 120 Vac power from the 460/480 Vac panel supply.*
10. *Provide sequencing control circuitry as specified herein.*

Note: This is a sample specification. Contact Various Technologies Incorporated System Division or your local distributor if you require further customization.