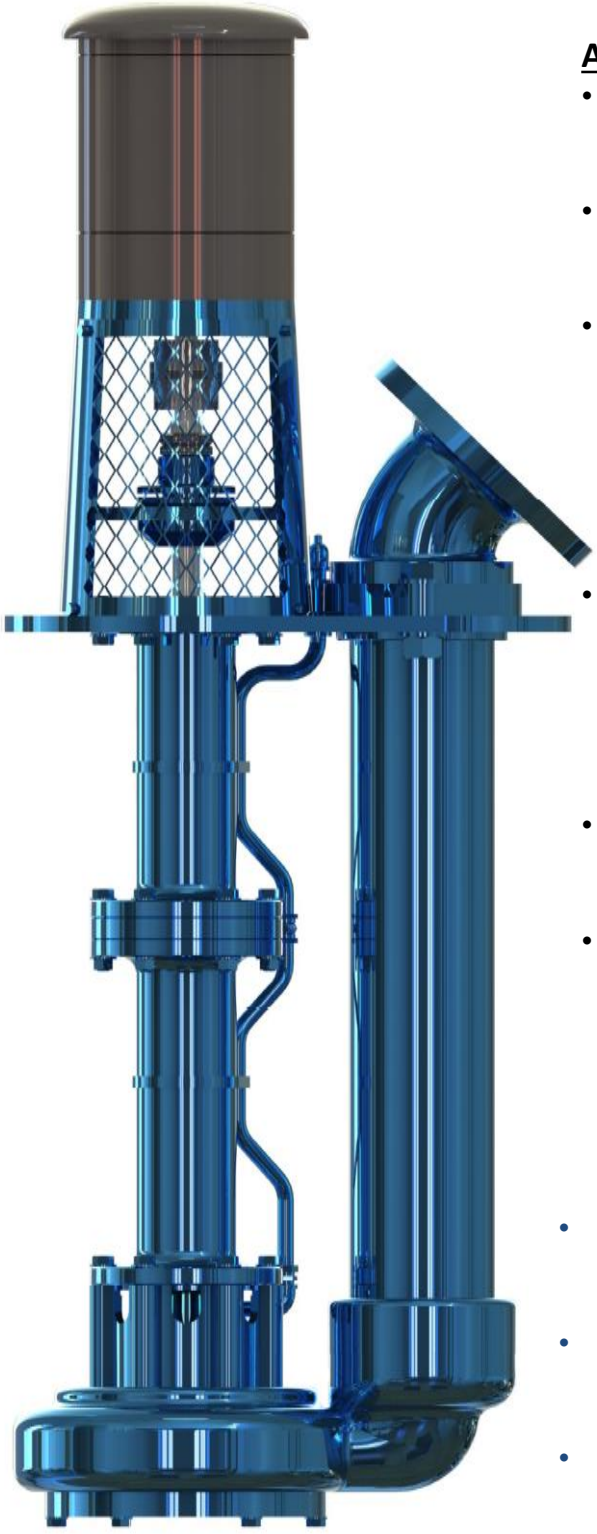
TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Wet Pit Installations

- Pumps suspended from pit or basin cover.
- Up to 3" Solids Handling
- 1750 and 1150 RPM Selections.
- Fiberglass and steel basins available.
- Steel covers and grouting frames for concrete pits.
- Control panels available for wall mounting adjacent to pump installation.
- High water alarms and level control devices with mechanical alternating options available.
- Grease lubricated shaft bearings.
- Flanged discharge connections.
- Cast iron support column piping with intermediate and lower bearing support.
- NEMA 1, 4 and 7 Float Controls for varying environments.



Applications:

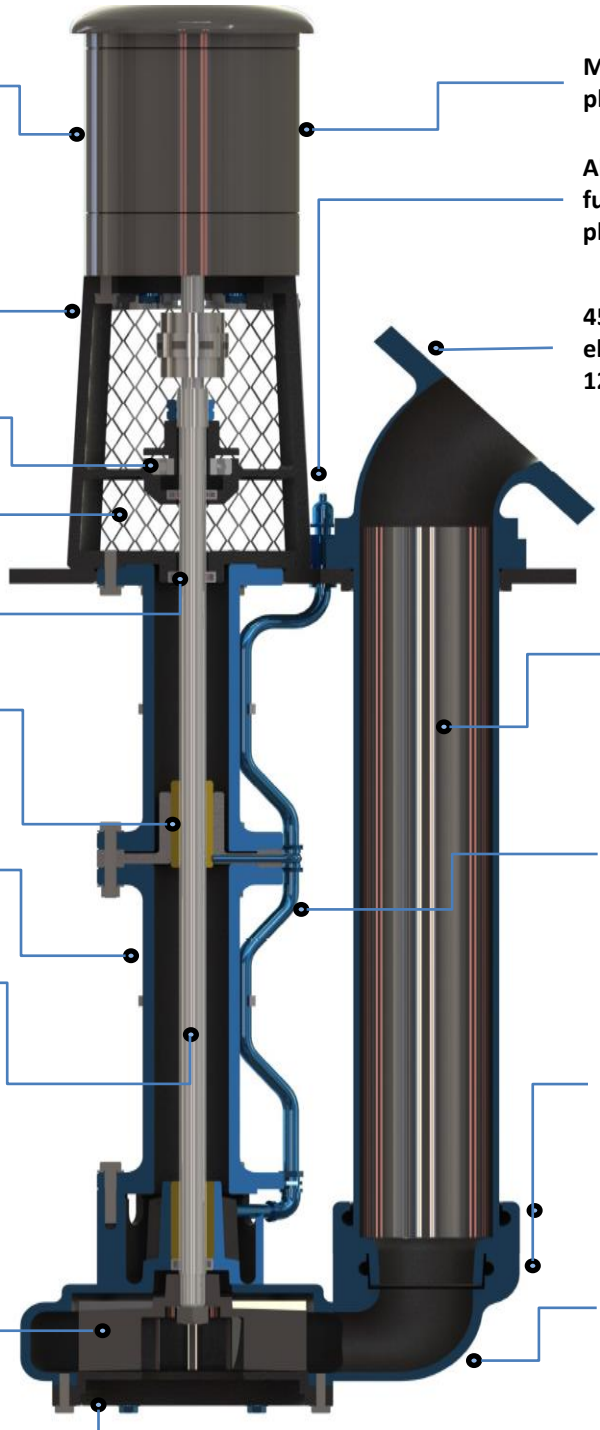
- Sewage Ejectors with float control lag pump operation.
- Sump dewatering where solids may be present.
- High temperature- available to 212 degree F- where submersible pump may fail due to temperature conditions.
- Special float switch assemblies providing brass or stainless steel floats based upon temperature and application.
- Systems available in Simplex, Duplex and Triplex designs.
- Pre-packaged pumps, basins, covers and float controls available upon request.

- *Temperatures to 212 Degree F*
- *Flow rates to 1600 GPM*
- *TDH to 150 Feet*
- *Available in Cast Iron or Bronze Fitted Construction.*

- *Above and below ground discharge designs available.*
- *Standard pit depths to 20 feet-other depths available.*
- *Motors in ODP, TEFC and Explosion Proof.*

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

SECTIONAL DRAWING



Electric motor available in ODP, TEFC and explosion proof designs. 1750 & 1150 RPM Selections

Machined cast iron motor support and upper bearing holder design.

Motor/pump shaft coupling with rubber insert

Upper thrust ball bearing with separate grease fitting.

Steel mesh coupling guard surrounding rotating shafts.

Pedestal shaft seal eliminates shaft leaks.

Bronze intermediate and lower bearings-grease lubricated design- with above base grease fittings.

Cast Iron bolted support "legs" provides rigid bearing support and long life.

High tensile steel shaft ground and polished.

Rugged cast iron impeller keyed to pump shaft and locked in place with impeller nut.

Cast Iron suction plate maintains close tolerances to provide continued pump performance.

Motors available in three phase and single phase.

Alemite grease fitting furnished above the cover plate for bearing lubrication.

45 Degree flanged discharge elbow with ASA standard 125 Lb. rated flange.

Special designed steel suspension plate for bolting to sewage pit or basin cover.

Steel discharge pipe locked in place to pump suspension plate and held in place with lower formed expansion joint.

Water resistant grease lines deliver pressurized grease from above ground fittings to each bearing.

Casing elbow seal at two locations ensures tight discharge pipe sealing to lower casing.

90 degree smooth transition discharge elbow.

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Basin/Pump Sizing Table

Recommended Minimum Pit & Basin Sizes

Item	Round Basin		Square Basin	
Pump Model	**Simplex**	**Duplex**	**Simplex**	**Duplex**
VSA-3F & 4F	30”	36”	30’ X 30”	36” X 36”
VSA-3A & 4A	30”	42”	30’ X 30”	42” X 42”
VSA-4C & 5C	36”	48”	36” X 36”	48” X 48”
VSA-4E & 5E	42”	48”	42” X 42”	48” X 48”
VSA-6H	48”	54”	48” X 48”	54” X 54”

Number of Water Closets	Pump Capacity (GPM) Normal Flush: 3.5Gal/Flush	Pump Capacity (GPM) Low Flush: 1.6Gal/Flush
1	50	30
2 or 3	75	45
4 or 5	100	60
6 or 7	125	75
8 to 10	150	90
11 to 15	200	120
16 to 20	250	150
21 to 25	300	180
26 to 30	350	210

When selecting the appropriate sewage pump, calculate the number of water closets to determine the flow rate of the correct pump.

Total discharge head (the pressure required by the pump) should include the following:

1. **Static Head**: The difference between the lowest point in the basin and the and the maximum height to where the pump discharges.
2. **Friction Loss**: Loss of head in the discharge line from friction through pipes, valves and other fittings.
3. **Back Pressure**: In cases where the run-off sewage is charged, ad for the sewer back pressure (generally from 2 Ft. to 8 Ft.)

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Basin/Pump Sizing Table

Recommended Minimum Pit & Basin Sizes

Other Considerations when sizing basins and pumps:

Outside drainage:

1. **Outside drainage**: Paved area 10 GPM per 1,000 square feet of area.
2. **Tile Drainage Bed**: (Sandy Soil): 15 GPM per 1,000 square feet of bed.
3. **Tile Drainage Bed** (Clay Soil): 8 GPM per 1,000 square feet of area

Unusual extra in-flow factors:

If drainage is to be included in the sewage pump load, such as boiler blow-down, air-conditioning condensate, swimming pools, display fountains, wash racks and other devices, add this additional inflow to the pump capacity calculated from outside drainage and water closets. (**NOTE: HOT BOILER OR CONDENSATE LIQUIDS ENTERING THE BASIN SHOULD NOT EXCEED MANUFACTURERS RECOMMENDATIONS- IF FIBERGLASS BASIN. IF CONCRETE PIT, REFER TO THE FACTORY OR LOCAL SALES REPRESENTATIVE IF TEMPERATURES EXCEED 130 DEGREE F.)**

High temperature Applications:

Many municipalities limit the temperature of the water discharged from a building into the City sewer systems. If hot water pump applications are planned refer to the Factory for revised pump construction, float bulb materials and high temperature grease requirements for the pump bearings. In addition, consider a water quench line where a temperature activated sensor allows cooled water to enter the basin for cooling purposes. Refer to attached HOT WATER SEWAGE PUMP SPECIFICATIONS FOR ADITIONAL INFORMATION.

Swimming Pool:

Refer to appropriate chemical composition information when considering draining chlorinated or other treated water to the sewage basin to ensure pump material components are compatible with the fluid. Also check with local Municipalities regarding types of treated fluids permissible in City Sewage Pump Systems.

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Basin/Pump Sizing Table

Recommended Minimum Pit & Basin Sizes

Invert:

When sizing the appropriate basin ensure the invert is sized to allow for appropriate pump operation between on/off cycles. Sufficient liquid storage should allow for the pump to operate for 10-15 starts per hour and not "over" cycle the pump operation due to insufficient liquid storage in the basin. Selection of the invert elevation and depth of the basin along with the basin diameter provide the basic components allowing the designer to select and specify the appropriate basin size. The designer should allow for 1 foot above the bottom of the basin for low water cut off. In projects where basin depth becomes an issue, the designer should increase the basin diameter to provide for appropriate pump cycling.

High water alarms are typically set 6 inches below the inlet to ensure liquid does not flow back into the system (once retained in the basin)

Selecting the Pump

Once the pump flow rate in GPM and pump pressure in feet TDH has been selected, refer to the attached selection tables and performance curves to select the appropriate pump model. The pump model will refer the designer to the minimum basin sizing, as a starting point, to assist in designing the correct basin sizes to prevent excessive pump cycling.

For assistance in the selection of basins and pump sizes, contact Federal Pump or a local federal Pump Representative for assistance.

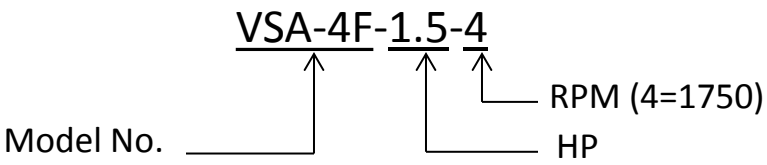
Duplex Systems:

Duplex systems are specified where each pump is designed for 100% of the flow rate with the float control systems designed to alternate operation of each pump for even wear. (Refer to attached suggested specifications) A properly designed duplex system with the correct basin sizes, temperature and fluid compatibility will assist in long pump life operation.

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Quick Pic-Pump Selection Table to 45'TDH**

1750 RPM



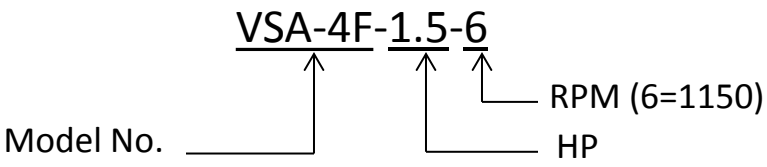
GPM	10' TDH	20'TDH	25'TDH	30'TDH	40'TDH	45'TDH
50	VSA-4F-.75-4 0.75HP	VSA-4F-1-4 1 HP	VSA-4F-1.5-4 1.5HP	VSA-4F-2-4 2HP	VSA-4F-3-4 3HP	VSA-4F-5-4 5HP
75	VSA-4F-.75-4 0.75HP	VSA-4F-1-4 1 HP	VSA-4F-1.5-4 1.5HP	VSA-4F-2-4 2HP	VSA-4F-3-4 3HP	VSA-4F-5-4 5HP
100	VSA-4F-1-4 1 HP	VSA-4F-1.5-4 1.5HP	VSA-4F-1.5-4 1.5HP	VSA-4F-2-4 2HP	VSA-4F-3-4 3HP	VSA-4A-5-4 5HP
125	VSA-4F-1-4 1 HP	VSA-4F-1.5-4 1.5HP	VSA-4F-2-4 2HP	VSA-4F-3-4 3HP	VSA-4A-5-4 5HP	VSA-4A-5-4 5HP
150	VSA-4F-1.5-4 1.5HP	VSA-4F-2-4 2HP	VSA-4F-2-4 2HP	VSA-4F-3-4 3HP	VSA-4A-5-4 5HP	VSA-4C-7.5-4 7.5HP
200	VSA-4F-2-4 2HP	VSA-4F-2-4 2HP	VSA-4A-5-4 5HP	VSA-4A-5-4 5HP	VSA-4A-5-4 5HP	VSA-4A-5-4 5HP
250	VSA-4A-3-4 3HP	VSA-4A-3-4 3HP	VSA-4A-5-4 5HP	VSA-4A-5-4 5HP	VSA-4A-5-4 5HP	VSA-4A-7.5-4 7.5HP
300	VSA-4A-3-4 3HP	VSA-4A-5-4 5HP	VSA-4A-5-4 5HP	VSA-4C-7.5-4 7.5HP	VSA-4C-7.5-4 7.5HP	VSA-4C-7.5-4 7.5HP
350	VSA-4A-5-4 5HP	VSA-4A-5-4 5HP	VSA-4A-5-4 5HP	VSA-4C-7.5-4 7.5HP	VSA-4C-7.5-4 7.5HP	VSA-4C-7.5-4 7.5HP
400	VSA-4A-5-4 5HP	VSA-4A-5-4 5HP	VSA-4C-7.5-4 7.5HP	VSA-4C-7.5-4 7.5HP	VSA-4C-7.5-4 7.5HP	VSA-4C-7.5-4 7.5HP
500	VSA-4A-5-4 5HP	VSA-4C-7.5-4 7.5HP	VSA-4C-7.5-4 7.5HP	VSA-4C-7.5-4 7.5HP	VSA-4C-10-4 10HP	VSA-4C-10-4 10HP

** Refer to performance curve for all selections. Discharge heads available to 120'TDH (at 1750 RPM) and flow rates available to 1600 GPM (at 1750 RPM). Quick-Pic table provided for ease in product selection for flow rates to 500GPM and Heads to 45'TDH.

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Quick Pic-Pump Selection Table to 50'TDH**

1150 RPM



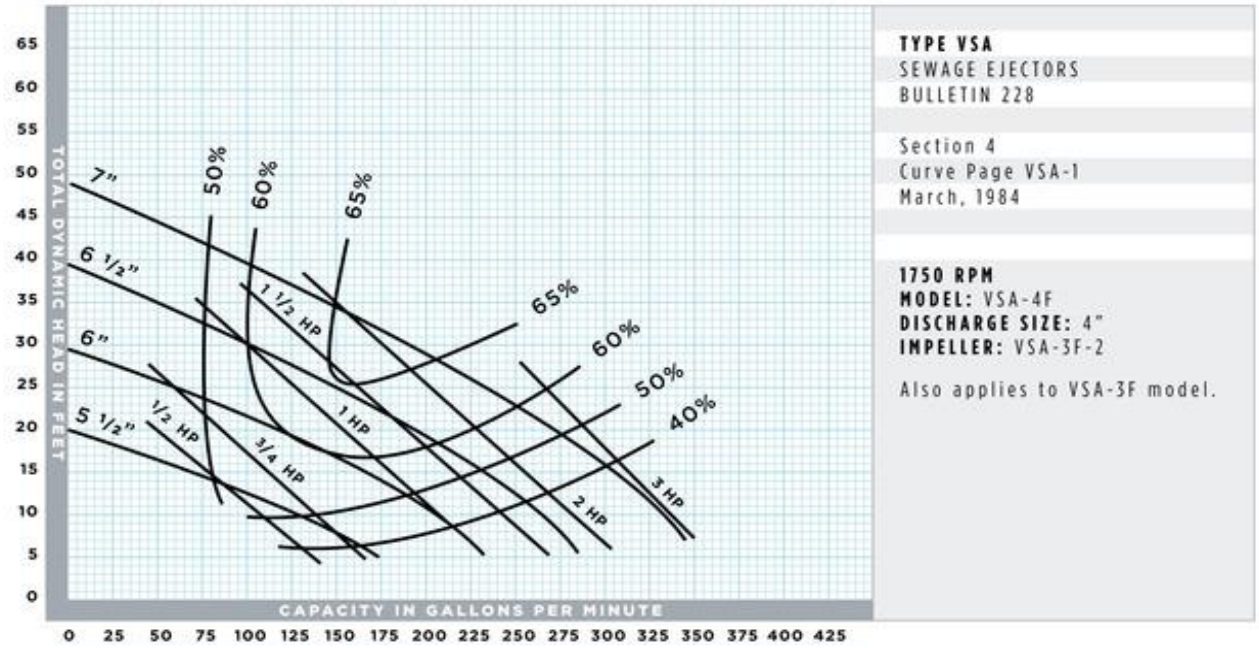
GPM	10' TDH	20'TDH	25'TDH	30'TDH	40'TDH	50'TDH
50	VSA-4F-.5-6 0.50HP	VSA-4F-.75-6 .75 HP	VSA-4A-1-6 1HP	VSA-4C-3-6 3 HP	VSA-4C-3-6 3 HP	VSA-4E-5-6 5 HP
75	VSA-4F-.5-6 0.50HP	VSA-4A-1-6 1HP	VSA-4A-1-6 1HP	VSA-4C-3-6 3 HP	VSA-4C-3-6 3 HP	VSA-4E-5-6 5 HP
100	VSA-4F-.5-6 0.50HP	VSA-4A-1-6 1HP	VSA-4A-1.5-6 1.5HP	VSA-4C-3-6 3 HP	VSA-4C-3-6 3 HP	VSA-4E-10-6 10 HP
125	VSA-4F-.5-6 0.75HP	VSA-4A-1.5-6 1.5HP	VSA-4C-2-6 2 HP	VSA-4C-3-6 3 HP	VSA-4C-3-6 3 HP	VSA-4E-10-6 10 HP
150	VSA-4A-1-6 1HP	VSA-4A-1.5-6 1.5HP	VSA-4C-2-6 2 HP	VSA-4C-3-6 3 HP	VSA-4C-3-6 3 HP	VSA-4E-10-6 10 HP
200	VSA-4A-1-6 1HP	VSA-4A-2-6 2 HP	VSA-4C-3-6 3 HP	VSA-4C-3-6 3 HP	VSA-4C-5-6 5 HP	VSA-4E-7.5-6 7.5 HP
250		VSA-4C-3-6 3 HP	VSA-4C-3-6 3 HP	VSA-4C-5-6 5 HP	VSA-4E-7.5-6 7.5 HP	VSA-4E-7.5-6 7.5 HP
300		VSA-4C-3-6 3 HP	VSA-4C-5-6 5 HP	VSA-4C-5-6 5 HP	VSA-4E-7.5-6 7.5 HP	VSA-4E-7.5-6 7.5 HP
350		VSA-4C-3-6 3 HP	VSA-4C-5-6 5 HP	VSA-4C-5-6 5 HP	VSA-4E-10-6 10 HP	VSA-4E-10-6 10 HP
400		VSA-4C-5-6 5 HP	VSA-4C-5-6 5 HP	VSA-4E-7.5-6 7.5 HP	VSA-4E-10-6 10 HP	VSA-4E-10-6 10 HP
500		VSA-4C-5-6 5 HP	VSA-4E-7.5-6 7.5 HP	VSA-4E-7.5-6 7.5 HP	VSA-4E-10-6 10 HP	VSA-4E-15-6 15 HP

** Refer to performance curve for all selections. Discharge heads available to 60'TDH (at 1150 RPM) and flow rates available to 1000 GPM (at 1150 RPM). Quick-Pic table provided for ease in product selection for flow rates to 500GPM and Heads to 50'TDH.

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Pump Performance Curves

1750 RPM

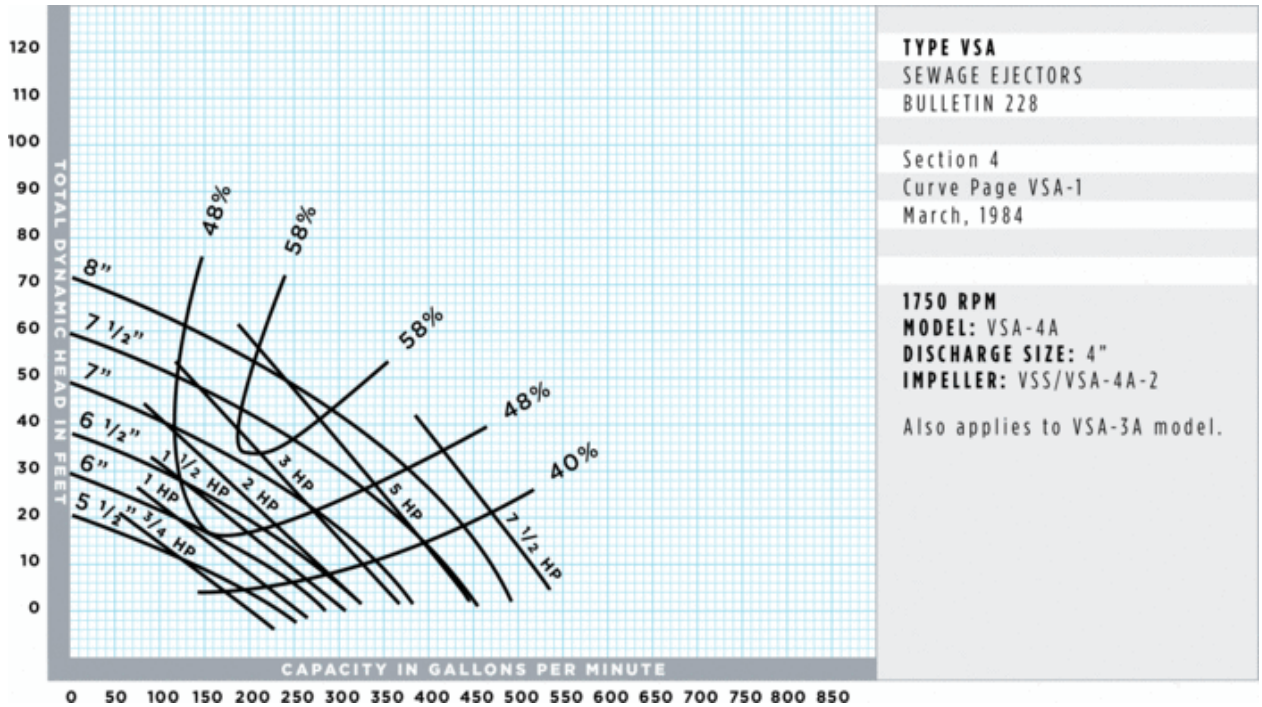


TYPE VSA
SEWAGE EJECTORS
BULLETIN 228

Section 4
Curve Page VSA-1
March, 1984

1750 RPM
MODEL: VSA-4F
DISCHARGE SIZE: 4"
IMPELLER: VSA-3F-2

Also applies to VSA-3F model.



TYPE VSA
SEWAGE EJECTORS
BULLETIN 228

Section 4
Curve Page VSA-1
March, 1984

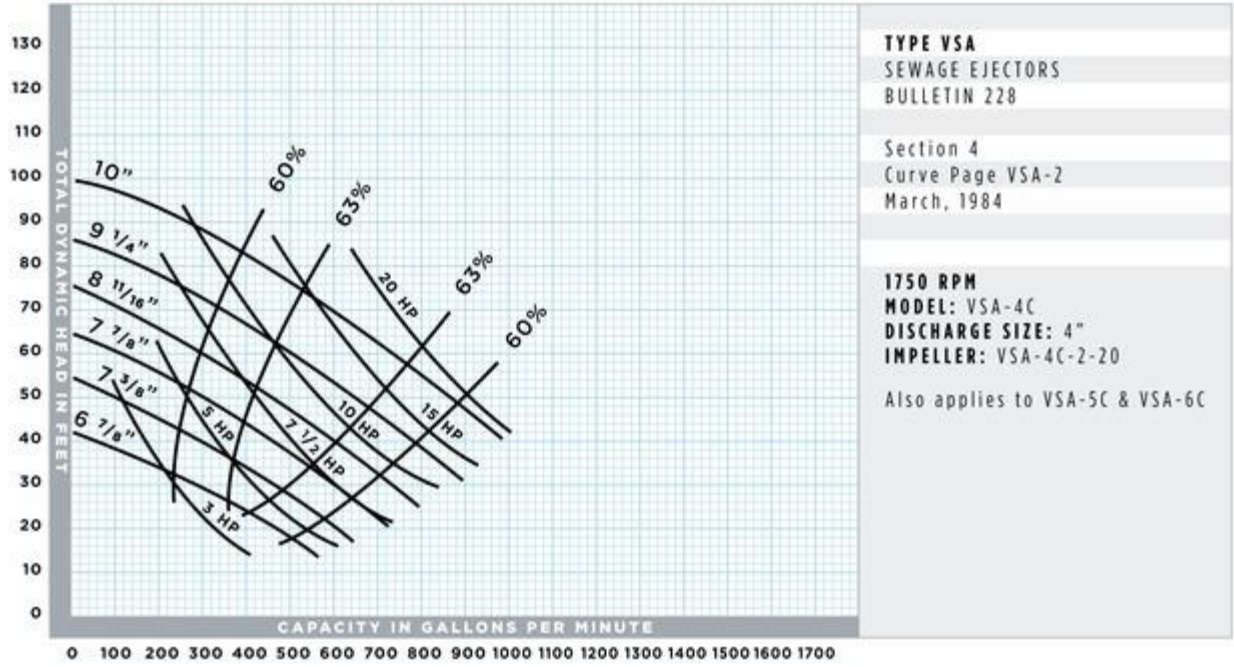
1750 RPM
MODEL: VSA-4A
DISCHARGE SIZE: 4"
IMPELLER: VSS/VSA-4A-2

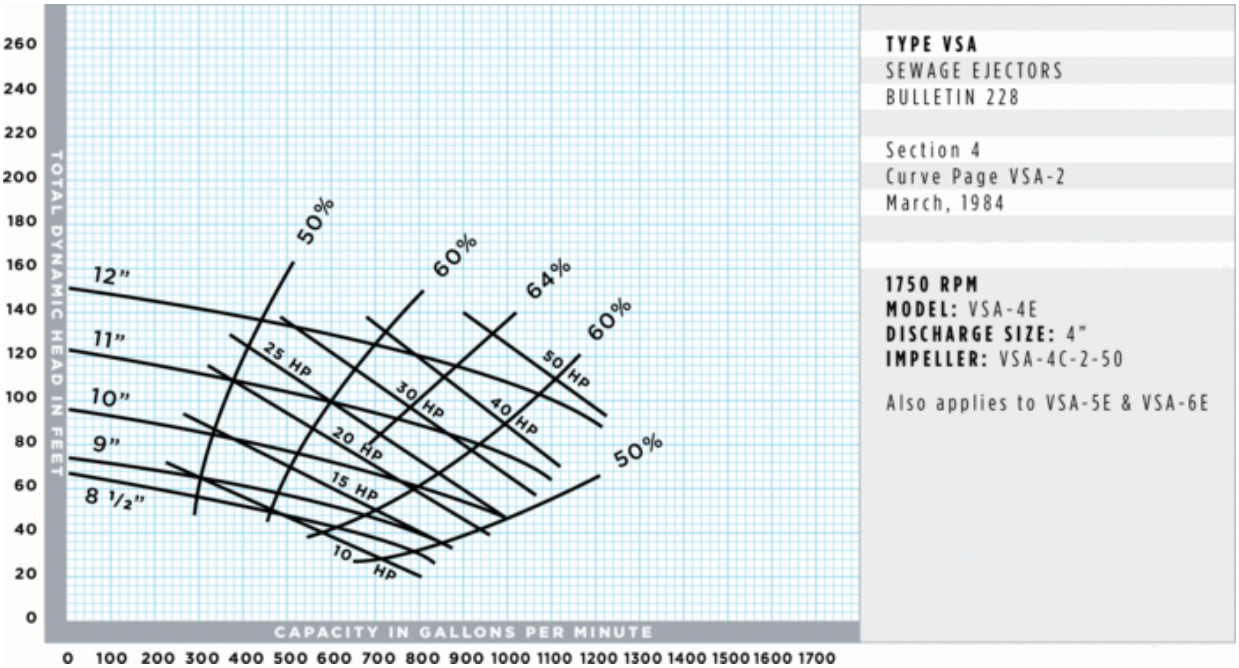
Also applies to VSA-3A model.

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Pump Performance Curves

1750 RPM

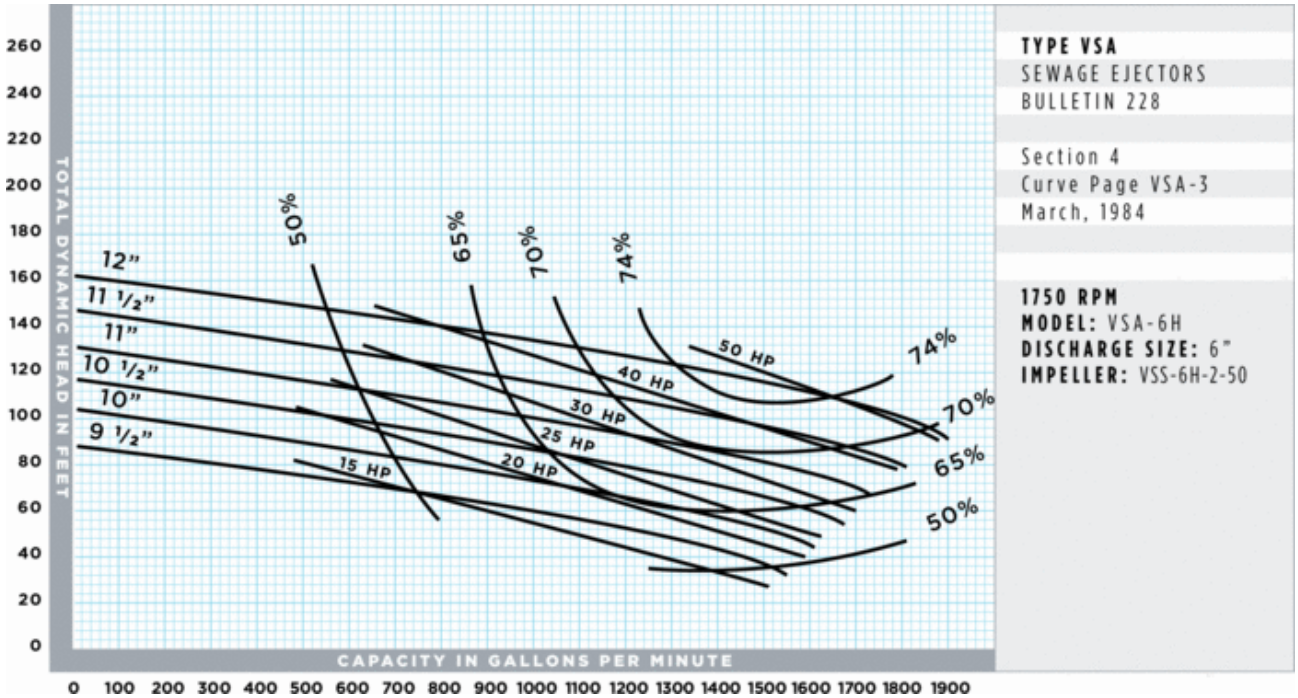




TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Pump Performance Curves

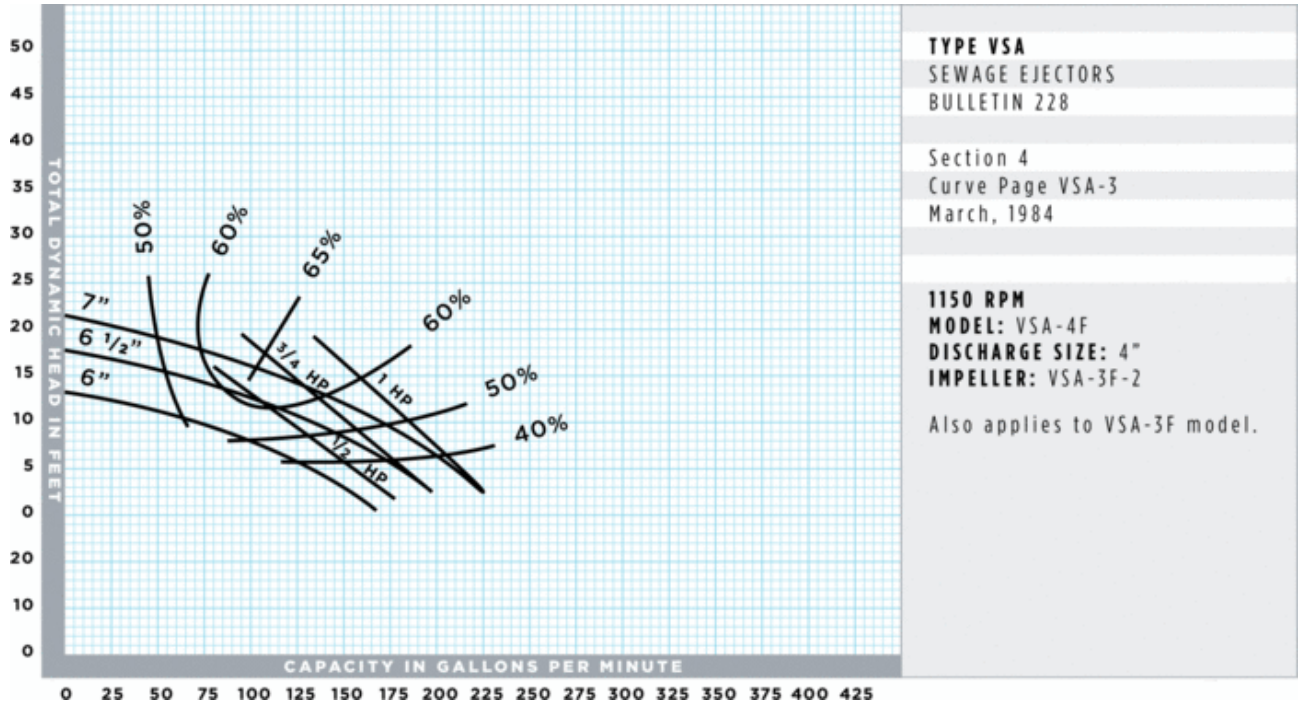
1750 RPM



TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Pump Performance Curves

1150 RPM

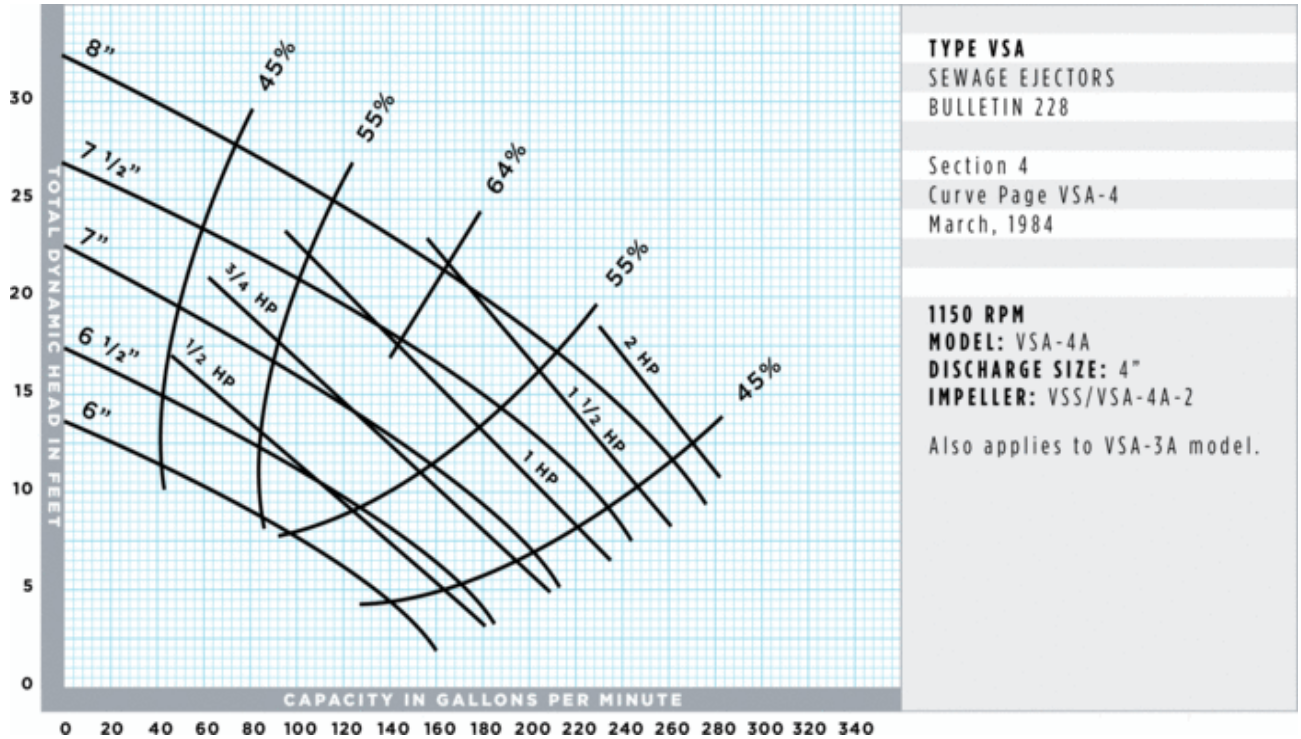


TYPE VSA
SEWAGE EJECTORS
BULLETIN 228

Section 4
Curve Page VSA-3
March, 1984

1150 RPM
MODEL: VSA-4F
DISCHARGE SIZE: 4"
IMPELLER: VSA-3F-2

Also applies to VSA-3F model.



TYPE VSA
SEWAGE EJECTORS
BULLETIN 228

Section 4
Curve Page VSA-4
March, 1984

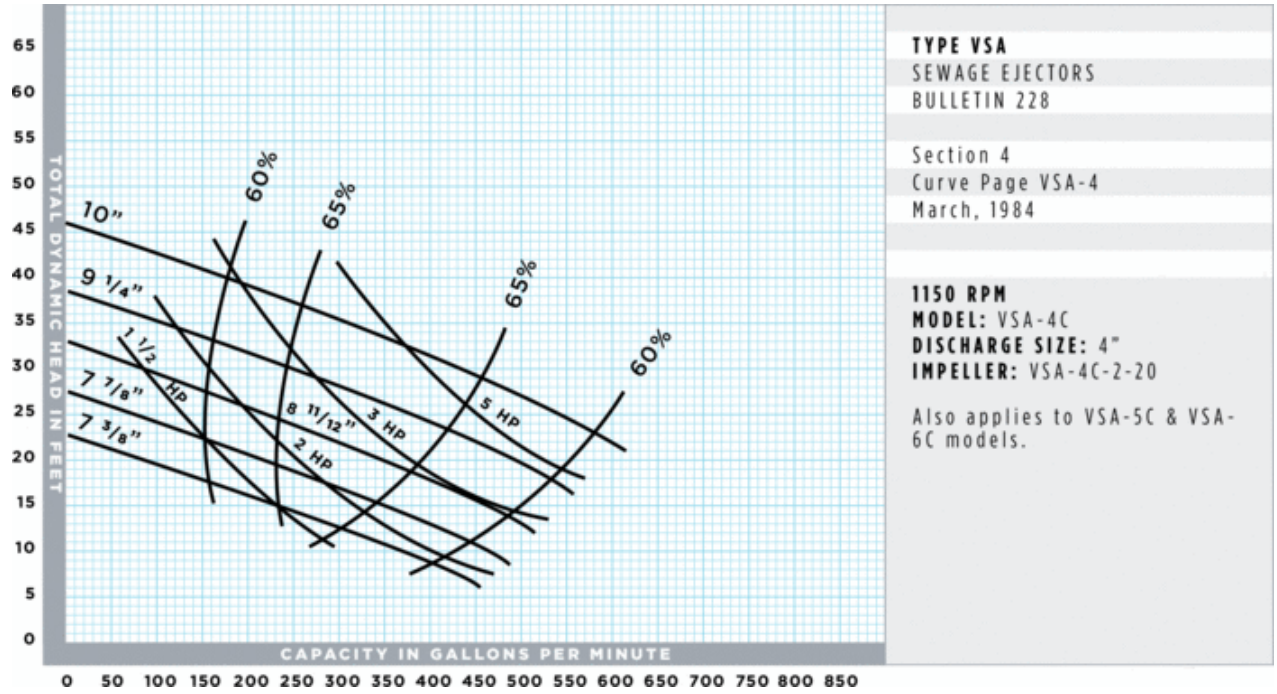
1150 RPM
MODEL: VSA-4A
DISCHARGE SIZE: 4"
IMPELLER: VSS/VSA-4A-2

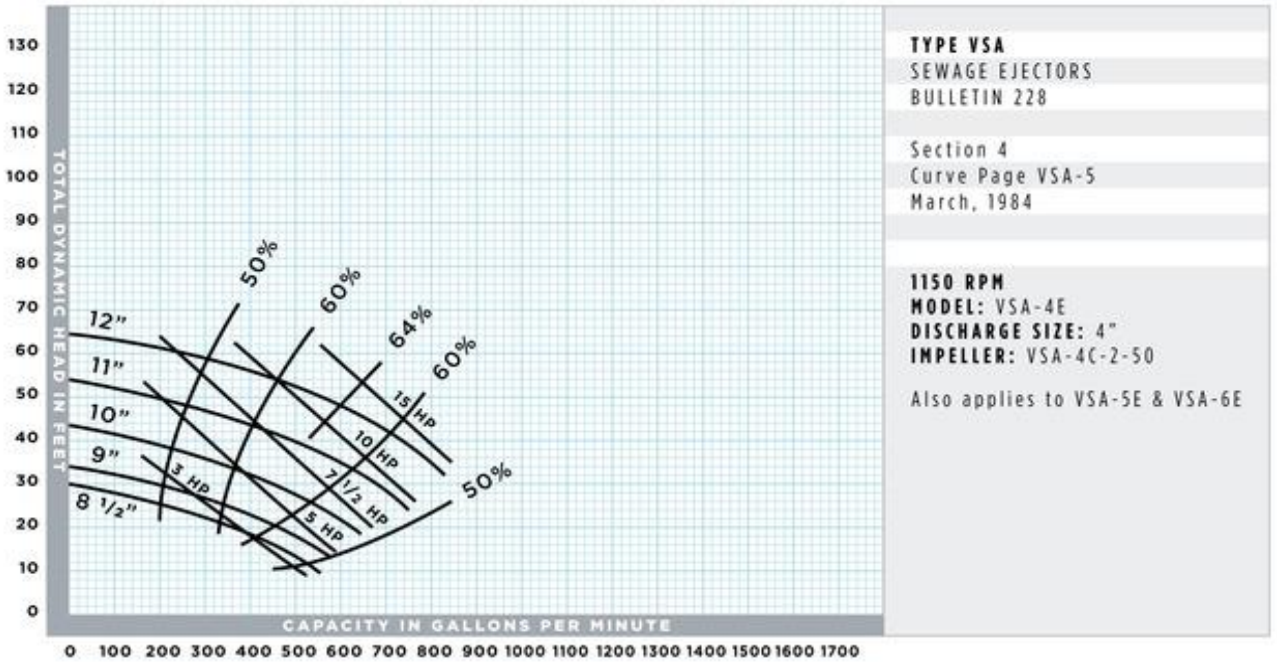
Also applies to VSA-3A model.

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Pump Performance Curves

1150 RPM

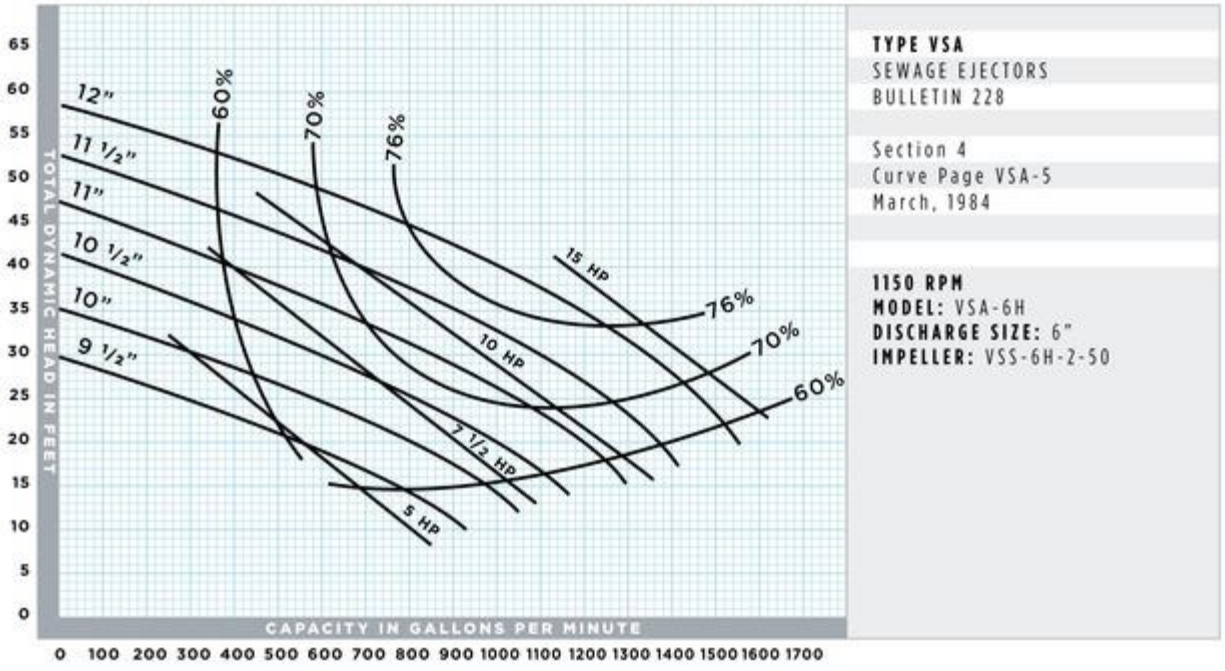




TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Pump Performance Curves

1150 RPM



TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

SUSPENED WET PIT SEWAGE VERSUS SUBMERSIBLE SEWAGE PUMPS

Hot Water Transfer to 212 Degree F

The arguments for submersible sewage pumps versus vertical suspended sewage pumps may favor the submersible sewage pumps especially in a controlled environment where water temperatures do not exceed 104 degree F. In hot temperature applications, however, vertical suspended sewage pumps may appeal to the end user especially if downtime and life cycle costs are taken into consideration. Regardless of the motor insulation factors, submersible pump installations expose power cables, floats and associated other wiring to the hostile high temperature environment which generally tend to limit life cycle simply due to the external elements, in this case high temperature, that tend to break down even the strongest plastic and rubber coatings, over time. When sewage and sump are exposed to high temperature environment due to spent steam condensate or other hot waste water applications, the end user may consider vertical suspended sewage pumps especially in short settings (less than 8 feet long) where bearing deflection is minimized.

Item	Vertical Sewage	Submersible Sewage
Motor	Air cooled-not submerged in hot fluids	Submerged in the hot fluids-limits motor life.
Bearings	Graphite Sleeve Type-High Temp Rating No grease lubrication required	Ball bearings no external grease-no external cooling.
Floats	Brass and Stainless	Plastic –prone to melting
Power cable	External to hot temperature fluids.	Installed in hot temperature fluids-prone to melting.
Replacement Motor	Available from any NEMA motor manufacturer. Typically in stock.	Special motor-available from only the pump manufacturer. Typically 6-8 weeks.
Maximum Temperature	212 Degree F	Standard: 104 Degree F Special: 160 Degree F
Automatic Quench System with air-gap.	Fully integrated System can be provided as an option.	Requires special plumbing and fixtures
Bearing Lengths	4-5 Feet Allows for some shaft deflection.	4-5” Minimizes shaft deflection
Repair and Maintenance	Lift entire vertical pump unit out of the pit. Bulky	Guide rail or lift installed pump with piping. Easy
Seal failure and water intrusion into the motor	No water intrusion into the motor-Motor external	Water intrusion and seal/motor failure potential.

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Suggested Specifications: Duplex Sewage Ejector-Fluid Temperatures to 135 degree F

Furnish and install where shown in the plans and detailed in the equipment schedule a series VSA Duplex vertical suspended sewage ejector pump system as manufactured by Federal Pump Corp of Brooklyn, NY. Pumps shall be rated as outlined in the equipment schedule and furnished in Duplex (two pump system) design. Pumps shall be supplied in concrete basin (fiberglass basin) and built for the pit depth outlined in the plans.

Pumps shall be constructed with cast iron fitted design with cast iron impeller and provided with flanged cast iron bearing support column pipe with integral cast flanges and bearings held between column support flanges with individual grease fittings supplied to each bearing. Bearings shall include renewable bronze sleeve bearings at pump case and renewable bronze sleeve bearings at the intermediate bearing locations. Bearing grease lubrication shall be general purpose lithium or polyurea thickened grease similar to 3AS Shell Alvania. Discharge pipe will be provided with expansion joints at each end with top flanged discharge connection.

Motors shall be supplied in Voltage, phase and RPM as outlined in the equipment schedule and be ODP (TEFC) construction.

Furnish a pedestal mounted mechanical alternating float switch to alternate lead and lag pumps based upon the conclusion of each pump cycle. Each pump shall be rated for 100% of the system flow requirement. The mechanical alternating float switch shall also allow for simultaneous pump operation of both pumps in times of high fluid intake. A standby auxiliary float will also be furnished to operate both pumps if the mechanical alternating float switch should fail. In addition to the pump control floats, the pump manufacturer will furnish a compression type high water alarm actuating switch and integral alarm horn equal to Federal Pump Model FS-5.

The alternating float switch shall have copper floats, brass rods, adjustable stops, galvanized steel rod guides equal to Federal Pump FS-4 and be provided with high water alarm contacts to signal high level alarm conditions.

Furnish a Duplex Sewage Ejector System control panel (for wall mounting and connection by the contractor). The Control panel shall be UL-508 listed and include individual across the line type magnetic starters with overload protection, fused disconnect switches, HOA selector switches, a single fused 115V secondary control circuit transformer and pump run lights, a single high water alarm red light with alarm horn and silence pushbutton control. Furnish dry contacts for remote indication of alarm functions.

Each duplex pump sewage ejector set will include a steel cover and frame for the concrete pit sized as shown in the plans and include Gasketing materials for gas tight installation. Duplex steel cover will be held in place with a steel frame embedded in the concrete sump. Each cover will include manhole opening to allow for float ball adjustments and be provided with vent connection flange installed in the cover by the pump manufacturer.

The contractor will install the pumps per the manufacturer's recommendation and ensure the pumps are not used for temporary construction water use. After installation the contractor will ensure the motors and float controls are free of any construction debris or air contaminants.

The pump manufacturer’s representative will complete the system start up and ensure the float controls, motors and duplex alternating cycle are correctly balanced. The start-up will include a 100% system operation and alternation cycle with high water alarms tested to ensure proper performance.

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Suggested Specifications: Duplex Sewage Ejector-Fluid Temperatures to 212 degree F

Furnish and install where shown in the plans and detailed in the equipment schedule a series VSA Duplex vertical suspended high temperature sewage ejector pump system as manufactured by Federal Pump Corp of Brooklyn, NY. Pumps shall be rated as outlined in the equipment schedule and furnished in Duplex (two pump system) design. Pumps shall be supplied in concrete pit (steel basin) and built for the pit depth outlined in the plans. Fiberglass basins will not be permitted due to the high fluid temperatures.

Pumps shall be constructed with cast iron fitted design with cast iron impeller and provided with flanged cast iron bearing support column pipe with integral cast flanges and bearings held between column support flanges with renewable graphite sleeve bearings at pumps case and renewable graphite sleeve bearings at the intermediate bearing locations. Discharge pipe will be provided with expansion joints at each end with top flanged discharge connection.

Motors shall be supplied in Voltage, phase and RPM as outlined in the equipment schedule and be ODP (TEFC) construction.

Furnish a pedestal mounted mechanical alternating float switch to alternate lead and lag pumps based upon the conclusion of each pump cycle. Each pump shall be rated for 100% of the system flow requirement. The mechanical alternating float switch shall also allow for simultaneous pump operation of both pumps in times of high fluid intake. A standby auxiliary float will also be furnished to operate both pumps if the mechanical alternating float switch should fail. In addition to the pump control floats, the pump manufacturer will furnish a compression type high water alarm actuating switch and integral alarm horn equal to Federal Pump Model FS-5.

The alternating float switch shall have copper floats, brass rods, adjustable stops, galvanized steel rod guides equal to Federal Pump FS-4 and be provided with high water alarm contacts to signal high level alarm conditions.

Furnish a Duplex Sewage Ejector System control panel (for wall mounting and connection by the contractor). The Control panel shall be UL-508 listed and include individual across the line type magnetic starters with overload protection, fused disconnect switches, HOA selector switches, a single fused 115V secondary control circuit transformer and pump run lights, a single high water alarm red light with alarm horn and silence pushbutton control. Furnish dry contacts for remote indication of alarm functions.

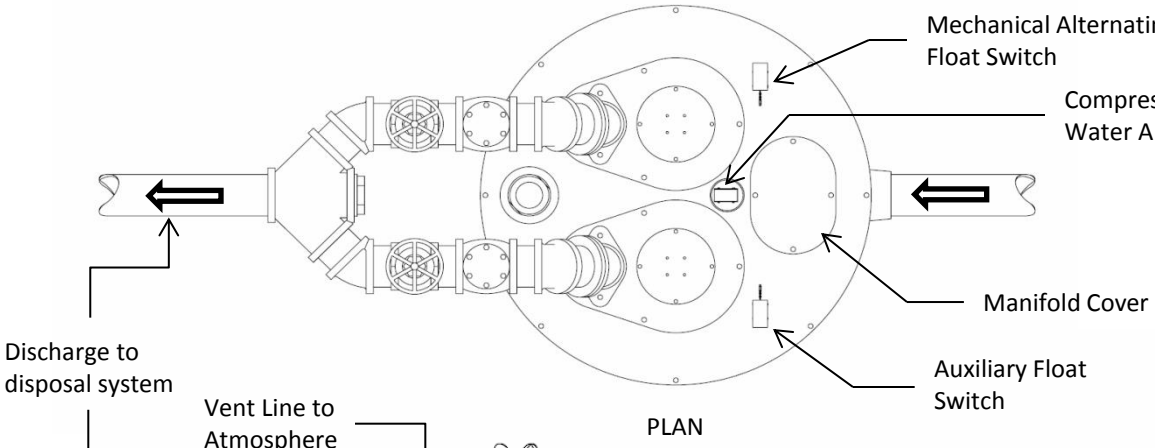
Each duplex pump sewage ejector set will include a steel cover and frame for the concrete pit sized as shown in the plans and include Gasketing materials for gas tight installation. Duplex steel cover will be held in place with a steel frame embedded in the concrete sump. Each cover will include manhole opening to allow for float ball adjustments and be provided with vent connection flange installed in the cover by the pump manufacturer.

The contractor will install the pumps per the manufacturer's recommendation and ensure the pumps are not used for temporary construction water use. After installation the contractor will ensure the motors and float controls are free of any construction debris or air contaminants.

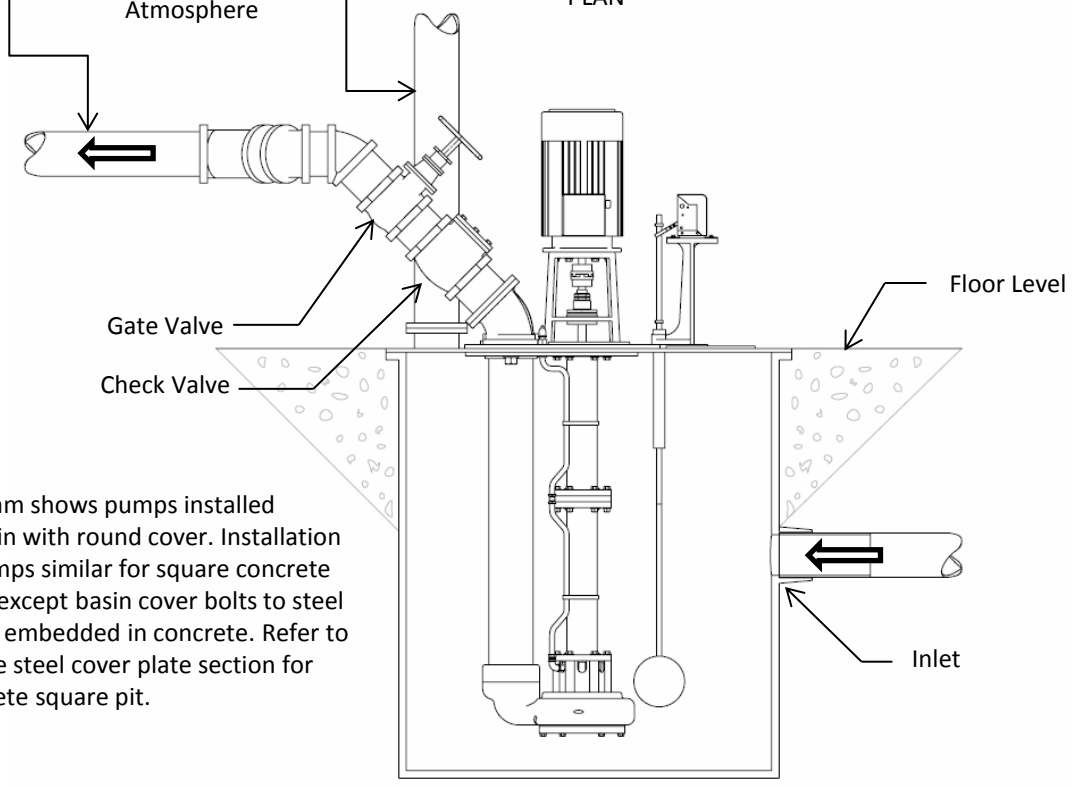
The pump manufacturer’s representative will complete the system start up and ensure the float controls, motors and duplex alternating cycle are correctly balanced. The start-up will include a 100% system operation and alternation cycle with high water alarms tested to ensure proper performance.

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

FEDERAL PUMP MODEL :INSTALLATION DIAGRAM
Pumps installed in round basin



PLAN

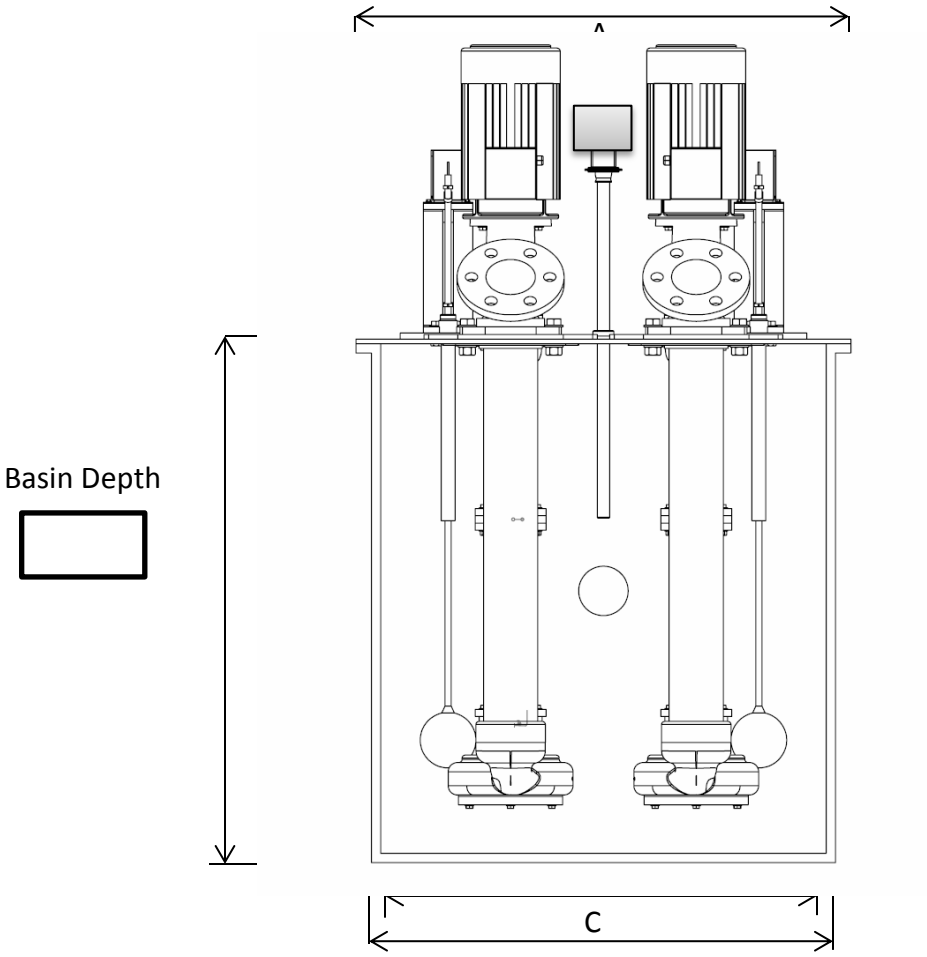


Elevation

Diagram shows pumps installed in basin with round cover. Installation of pumps similar for square concrete basin except basin cover bolts to steel frame embedded in concrete. Refer to square steel cover plate section for concrete square pit.

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

FEDERAL PUMP MODEL :INSTALLATION DIAGRAM
Dimensions (inches)

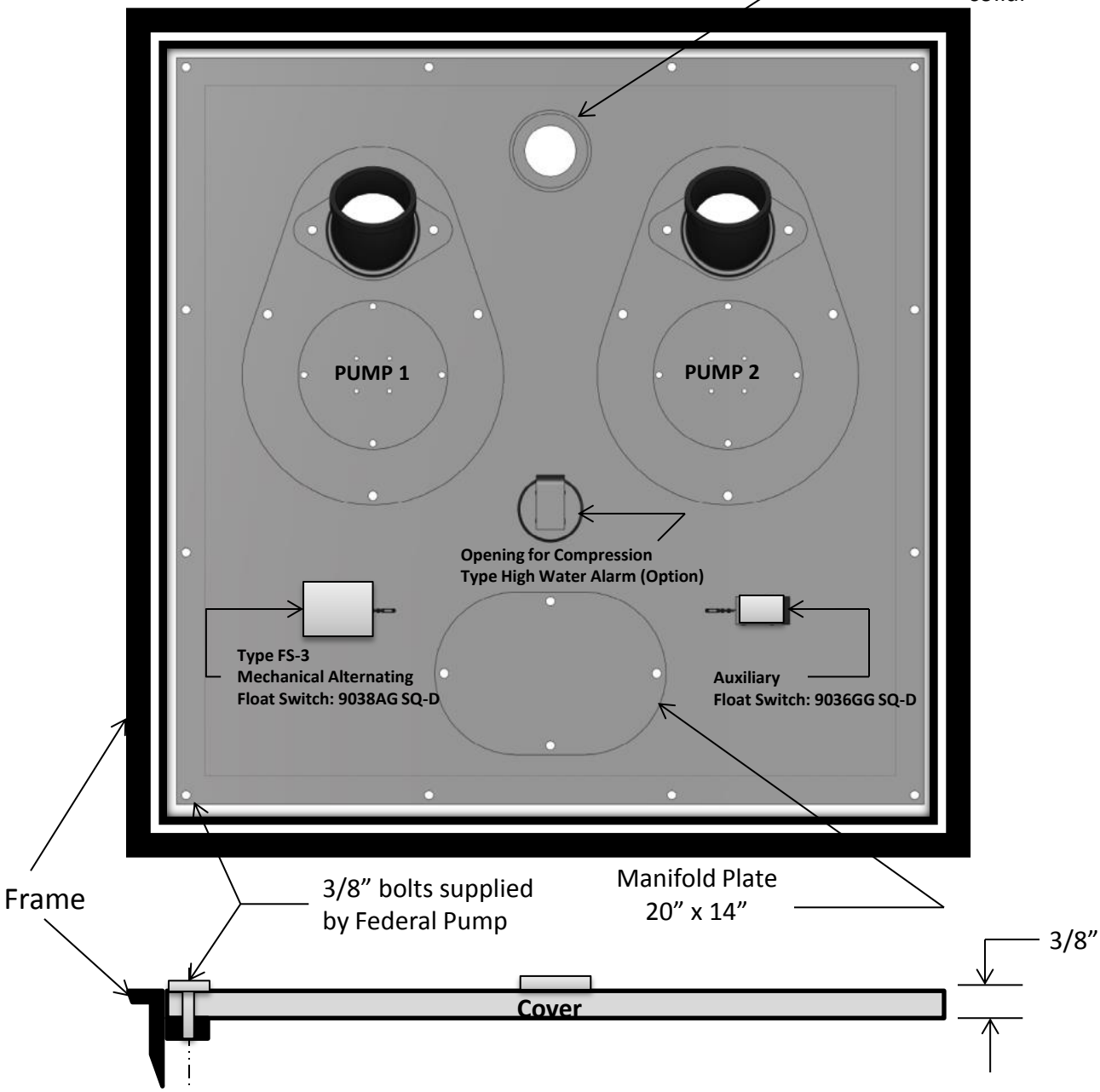


BASIN DIMENSIONS (inches)				Top Basin Connections (inches)		
B-Basin ID	Approx. Gall per foot depth	A Cover Diam.	C Approximate	No. of Tapping's	Bolt Size	Bolt Circle Diameter
30	37	34	31	6	0.375	32.5
36	55	40	37	6	0.375	38.5
42	70	46	43	8	0.5	44.5
48	95	53	49	8	0.5	51
54	120	60	55	12	0.5	57
60	150	66	61	12	0.5	63
72	210	78	73	16	0.5	75
84	290	90	85	16	0.5	87

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Square Steel Duplex Cover

Cover Description

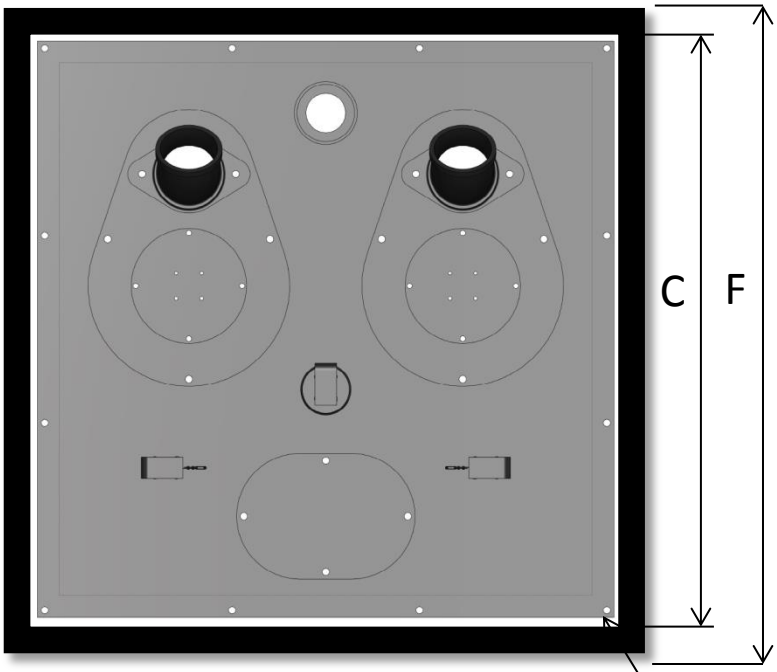


Refer to attached page for cover dimensions

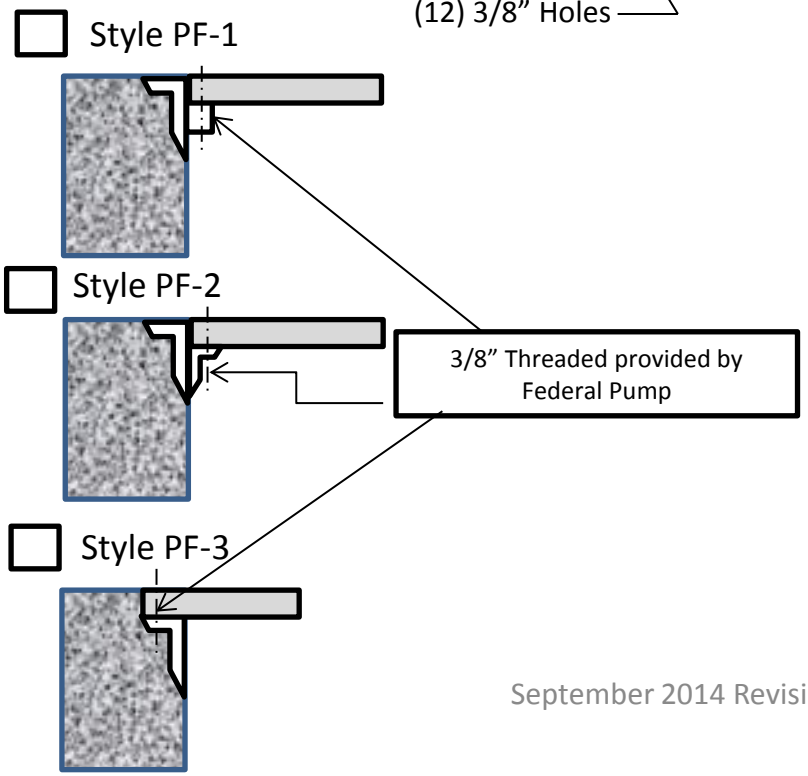
TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Dimensions (inches)

Square Steel Duplex Cover



Steel Frame Detail



Frame Style : PF-1 & PF-2

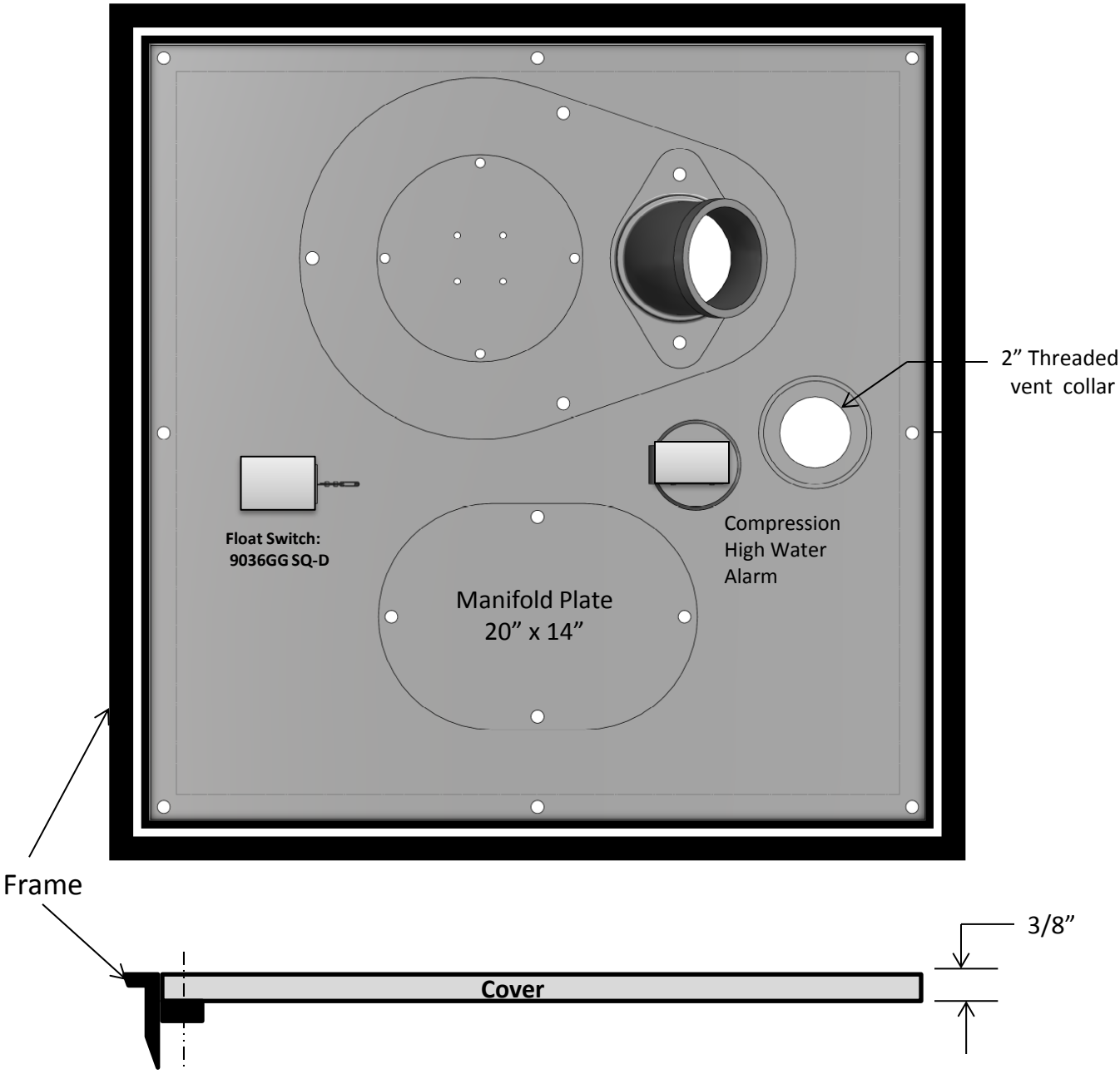
Pit ID	Cover Size (C)	Frame Size (F)
30" X 30"	30" X 30"	36' X 36"
36' X 36"	36' X 36"	42" x 42"
42" x 42"	42" x 42"	48 " X 48"
48 " X 48"	48 " X 48"	54" X 54"
54" X 54"	54" X 54"	60" X 60"
60" X 60"	60" X 60"	66" X 66"
66" X 66"	66" X 66"	72" X 72"
72" X 72"	72" X 72"	78" X 78"
78" X 78"	78" X 78"	84" X 84"
84" X 84"	84" X 84"	90" X 90"

Frame Style : PF-3

Pit ID	Cover Size (C)	Frame Size (F)
30" X 30"	36' X 36"	36' X 36"
36' X 36"	42" x 42"	42" x 42"
42" x 42"	48 " X 48"	48 " X 48"
48 " X 48"	54" X 54"	54" X 54"
54" X 54"	60" X 60"	60" X 60"
60" X 60"	66" X 66"	66" X 66"
66" X 66"	72" X 72"	72" X 72"
72" X 72"	78" X 78"	78" X 78"
78" X 78"	84" X 84"	84" X 84"
84" X 84"	90" X 90"	90" X 90"

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

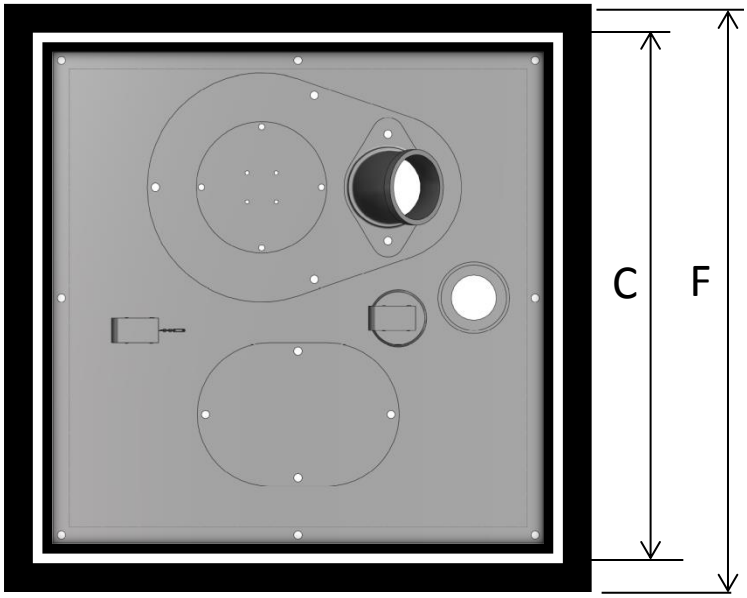
Square Steel Simplex Cover



TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Dimensions (inches)

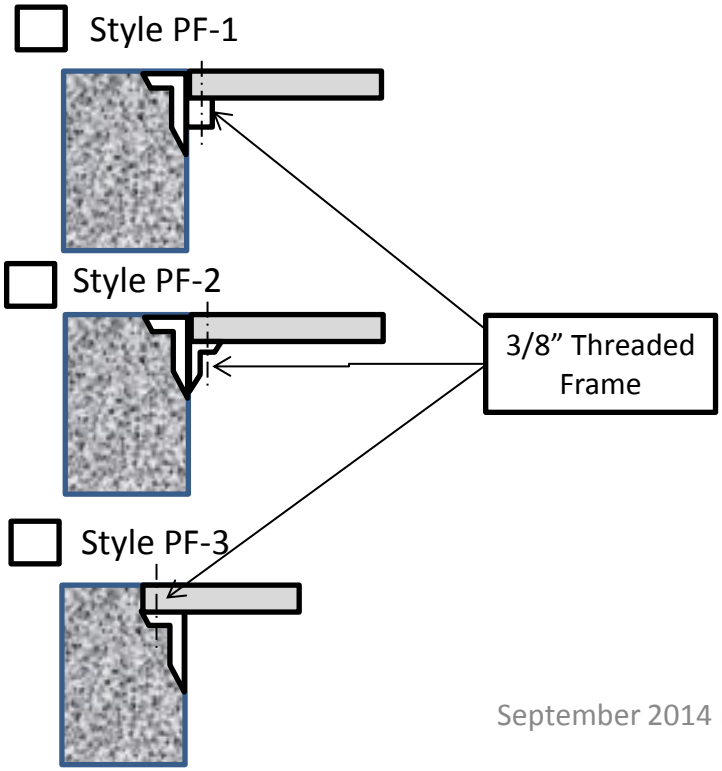
Square Steel Simplex Cover



Frame Style : PF-1 & PF-2

Pit ID	Cover Size (C)	Frame Size (F)
18” X 18”	24” x 24”	24” x 24”
24” X 24”	30” X 30”	30” X 30”
30” X 30”	30” X 30”	36’ X 36”
36’ X 36”	36’ X 36”	42” x 42”
42” x 42”	42” x 42”	48 “ X 48”
48 “ X 48”	48 “ X 48”	54” X 54”
54” X 54”	54” X 54”	60” X 60”
60” X 60”	60” X 60”	66” X 66”
66” X 66”	66” X 66”	72” X 72”
72” X 72”	72” X 72”	78” X 78”
78” X 78”	78” X 78”	84” X 84”
84” X 84”	84” X 84”	90” X 90”

Steel Frame Detail

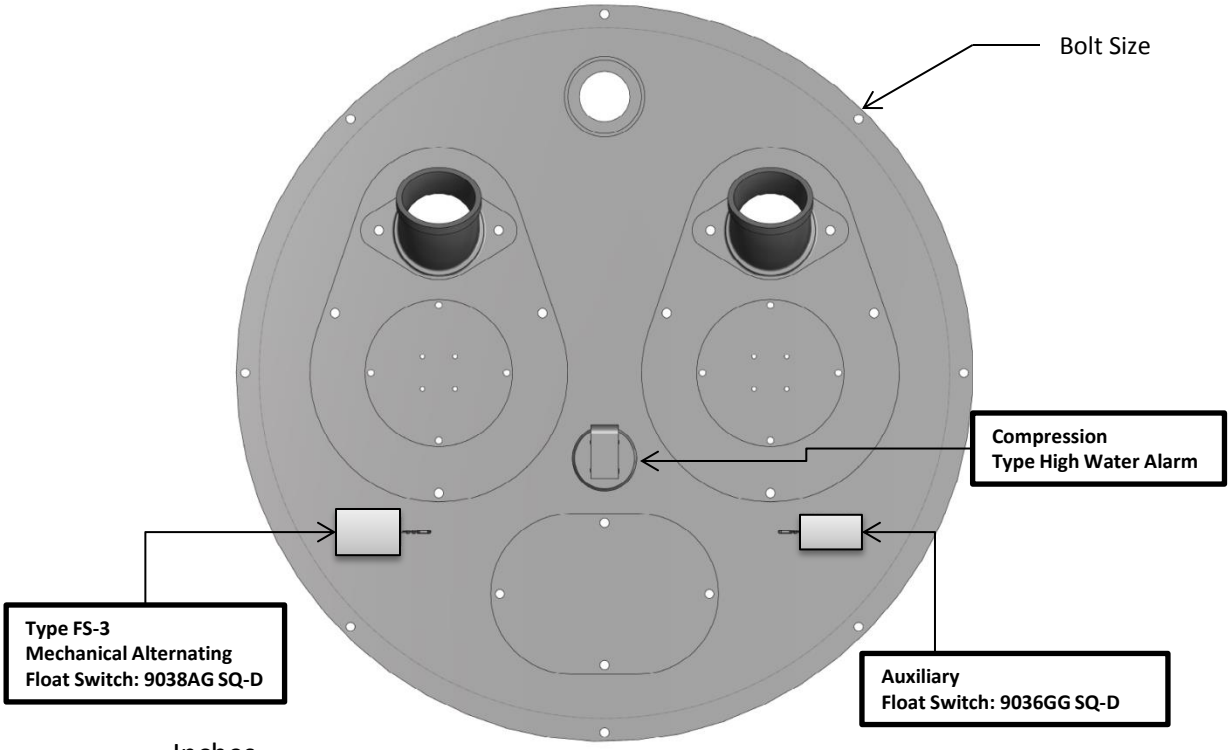


Frame Style : PF-3

Pit ID	Cover Size (C)	Frame Size (F)
30” X 30”	36’ X 36”	36’ X 36”
36’ X 36”	42” x 42”	42” x 42”
42” x 42”	48 “ X 48”	48 “ X 48”
48 “ X 48”	54” X 54”	54” X 54”
54” X 54”	60” X 60”	60” X 60”
60” X 60”	66” X 66”	66” X 66”
66” X 66”	72” X 72”	72” X 72”
72” X 72”	78” X 78”	78” X 78”
78” X 78”	84” X 84”	84” X 84”
84” X 84”	90” X 90”	90” X 90”

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

DUPLEX STEEL ROUND COVER



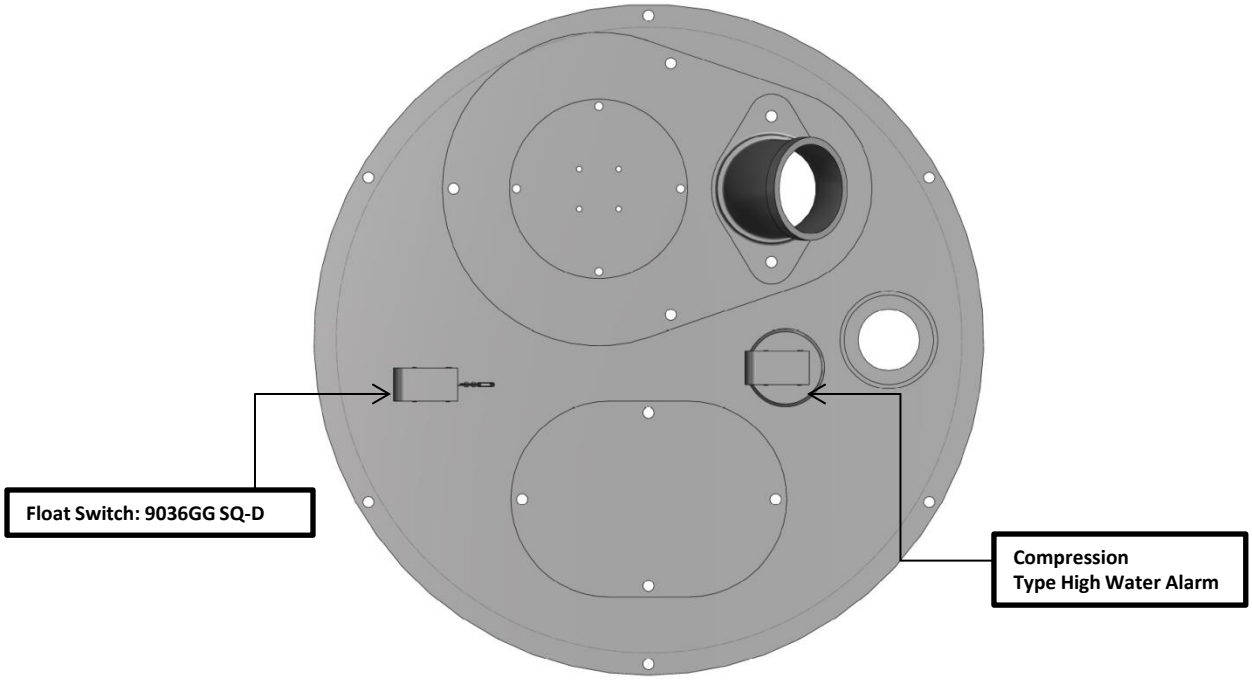
Inches

B-Basin ID	No. of Tapping's	Bolt Size	Bolt Circle Diameter
30	6	0.375	32.5
36	6	0.375	38.5
42	8	0.375	44.5
48	8	0.375	51
54	12	0.375	57
60	12	0.375	63
72	16	0.375	75
84	16	0.375	87

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

SIMPLEX STEEL ROUND COVER

Bolt Siz



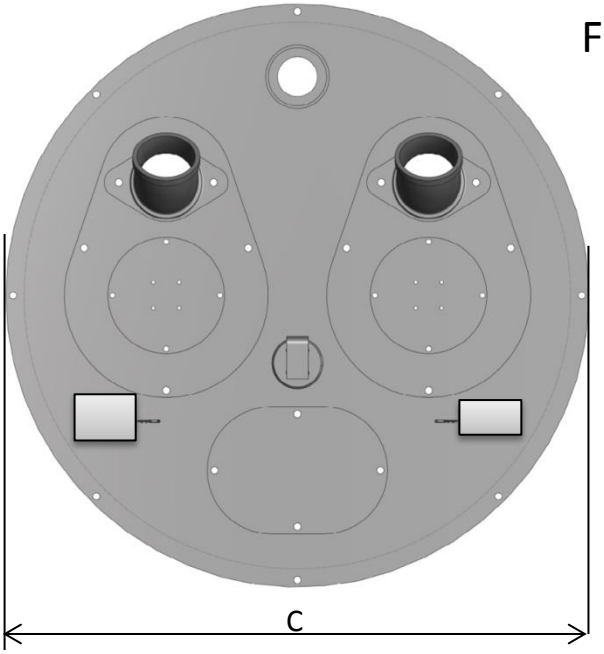
Inches

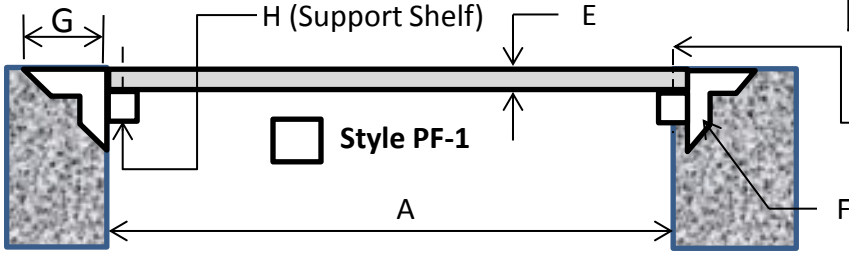
B-Basin ID	No. of Tapping's	Bolt Size	Bolt Circle Diameter
18	6	0.375	21
24	6	0.375	27
30	6	0.375	32.5
36	6	0.375	38.5
42	8	0.375	44.5
48	8	0.375	51
54	12	0.375	57
60	12	0.375	63
72	16	0.375	75
84	16	0.375	87

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

STEEL ROUND COVER AND FRAME (Simplex or Duplex)

For Concrete Pits-Frame Style PF-1





Inches

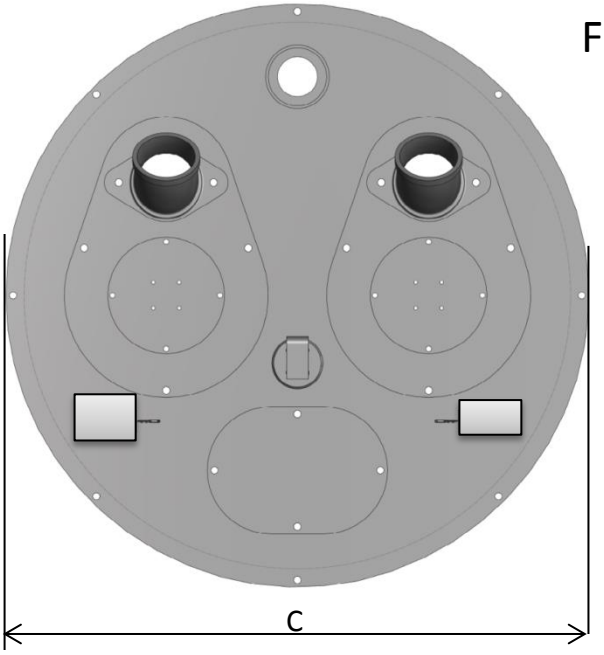
Pit ID	Cover Size (C)	Frame Size (F)
18	18	2 X 2 ¼
24	24	2 X 2 ¼
30	30	2 X 2 ¼
36	36	2 X 2 ¼
42	42	2 X 2 ¼
48	48	2 ½ X2 ½ X ¼
54	54	3 x 3 ¼
60	60	3 x 3 ¼
72	72	3 x 3 ¼
78	78	3 x 3 ¼
84	84	3 x 3 ¼

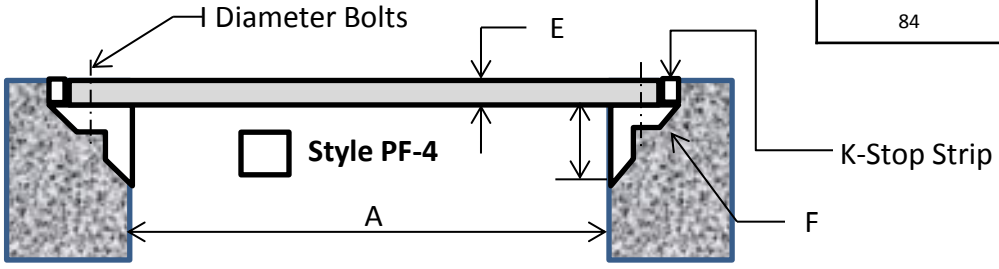
Pit Diameter	A	C	E	G	H	I
18	18	18	3/8	2	3/8 X 1	3/8
24	24	24	3/8	2	3/8 X 1	3/8
30	30	30	3/8	2	3/8 X 1	3/8
36	36	36	3/8	2	3/8 X 1	3/8
42	42	42	3/8	2	3/8 X 1	3/8
48	48	48	3/8	2 ½	3/8 X 1	3/8
54	54	54	3/8	2	3/8 X 1	3/8
60	60	60	3/8	2	3/8 X 1	3/8
72	72	72	3/8	2	3/8 X 1	3/8
78	78	78	3/8	2	3/8 X 1	3/8
84	84	84	3/8	2	3/8 X 1	3/8

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

STEEL ROUND COVER AND FRAME (Simplex or Duplex)

For Concrete Pits-Frame Style PF-4





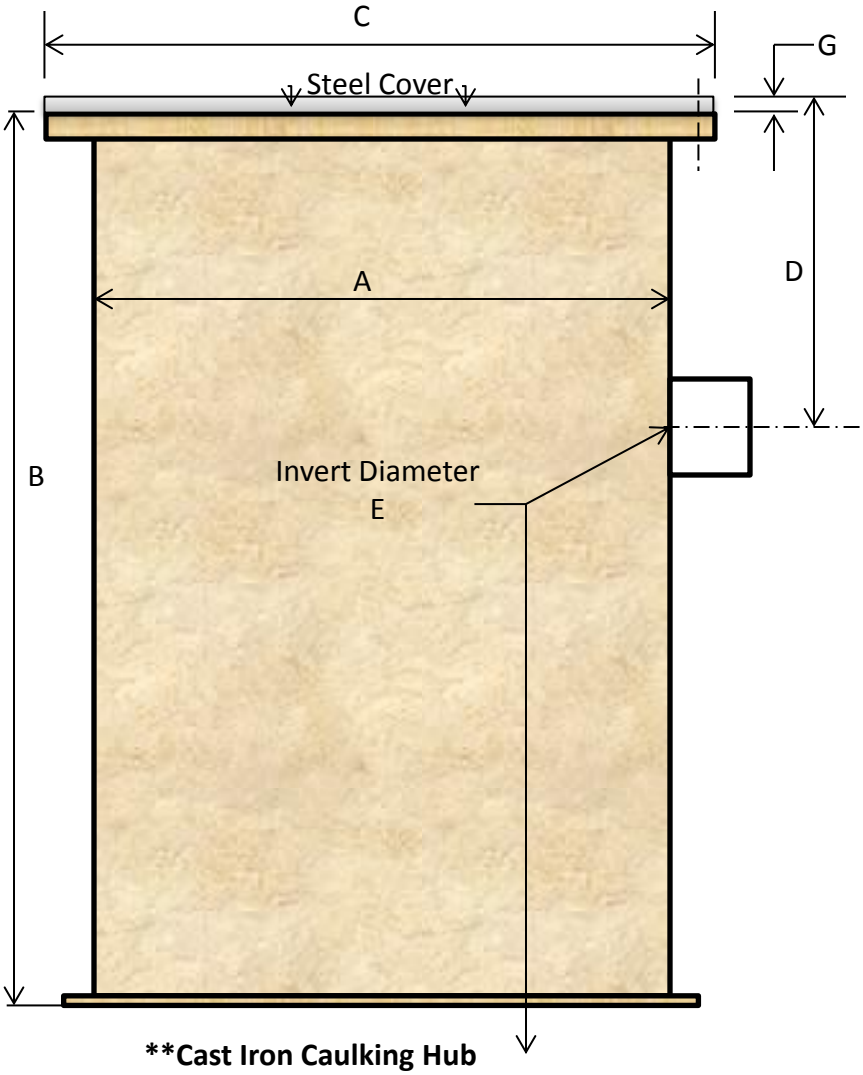
Inches

Pit ID	Cover Size (C)	Frame Size (F)
18	22	2 X 2 ¼
24	28	2 X 2 ¼
30	34	2 X 2 ¼
36	40	2 X 2 ¼
42	46	2 X 2 ¼
48	53	2 ½ X2 ½ X ¼
54	60	3 x 3 ¼
60	66	3 x 3 ¼
72	78	3 x 3 ¼
78	84	3 x 3 ¼
84	90	3 x 3 ¼

Pit Diameter	A	C	E	G	K	I
18	18	22	3/8	2	¾ X ¼	3/8
24	24	28	3/8	2	¾ X ¼	3/8
30	30	34	3/8	2	¾ X ¼	3/8
36	36	40	3/8	2	¾ X ¼	3/8
42	42	46	3/8	2	¾ X ¼	3/8
48	48	53	3/8	2 ½	1 X 3/8	3/8
54	54	60	3/8	2	1 X 3/8	3/8
60	60	66	3/8	2	1 X 3/8	3/8
72	72	78	3/8	2	1 X 3/8	3/8
78	78	84	3/8	2	1 X 3/8	3/8
84	84	90	3/8	2	1 X 3/8	3/8

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

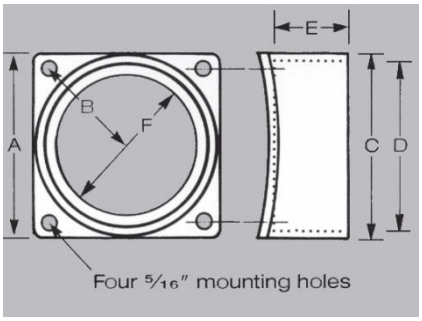
FIBERGLASS BASIN Dimensions (Inches)



Pit ID A	Steel Cover Diameter (C)	Cover Thickness (G)
18	22	3/8
24	28	3/8
30	34	3/8
36	40	3/8
42	46	3/8
48	52	3/8
54	60	3/8
60	66	3/8
72	78	3/8
78	84	3/8
84	90	3/8

Basin Depth (B)	Invert CL from finished floor (D)	Invert Size Diameter E

****Cast Iron Caulking Hub**



SIZE	2"	3"	4"	6"
A	4"	4 3/4"	6"	8"
B	2 1/8"	2 5/8"	3 3/8"	4 5/8"
C	3 3/4"	4 5/8"	5 7/8"	7 3/4"
D	3"	4"	5 1/8"	7 1/8"
E	2"	2 1/8"	2 1/4"	2 1/4"
F	2"	3"	4 1/8"	6 1/8"

****Hub ships loose for field assembly by others!**

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Factory Standard Float Control Offering

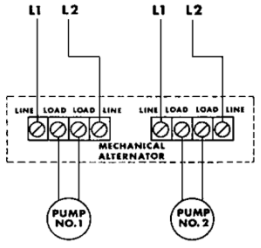
Installation	Federal Standard Offering Model No	Sq.-D Version	Description
Simplex	FS-1	Quan -1 9036-GG-2	Simplex on/off two pole operation. Available for single phase or three phase use.
Duplex (Option 1)	FS-2	Quan -2 9036-GG-2 Floats	Includes two type 9036-GG-2 float switches for individual pump operations. Both pumps will operate as the inflow requires. For this float sequence, a electric alternator should be provided in the control panel to alternate the two pumps. There are no stand-by floats included in this control sequence.
Duplex	FS-3	Quan -1 9038-AG-1	Mechanical Alternating float switch that controls both pumps and alternates the lead and lag after each pump cycle. Available in single and three phase operation.
Duplex	FS-4	Quan -1 9038-AG-1 & Quan -1 9036-GG-2 as stand-by auxiliary float.	Mechanical Alternating float switch that controls both pumps and alternates the lead and lag after each pump cycle. Available in single and three phase operation. This option also includes a FS-1 two pole axillary float switch to operate pumps 1 & 2 in the event the mechanical alternating float switch fails.
High Water Alarm Option : 1	FS-5	Quan-1 Compression Type High water Alarm	This option is provided with a n internal alarm horn mounted on top of a compression tube. As the water level rises, air compresses in the tube and activates the alarm horn to advise of high water alarm conditions. The option requires the contractor to provide a reliable 115V supply to the compression fitting and bell
High Water Alarm Option : 2 For Duplex Operation	FS-6	Quan -1 Additional high water alarm contact in the mechanical alternating float switch. 9038-AG-1-N5	This option provides an additional contact in the mechanical alternation float switch where the above standard FS-4 (9038-AG-1) is modified to 9038-AG-1-N5. The “N5” option provides the additional contact in the mechanical alternation float switch that would then activate the high level alarm light or horn. The option does not provide for any alarm horn or light-it simply provides the contact from the float switch.

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

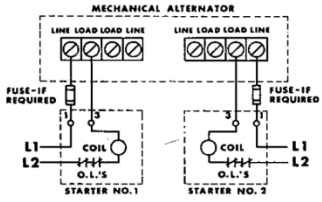
FEDERAL PUMP MODEL : FS-3-CLASS 9038AG-1
MECHANICAL ALTERNATING FLOAT SWITCH

*WHERE SEPARATE POWER SUPPLIES ARE PROVIDED THE DISCONNECT MEANS FOR EACH MOTOR MUST BE GROUPED TOGETHER AND PROVIDED WITH SUITABLE WARNINGS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND ALL OTHER APPLICABLE CODES AND STANDARDS.

CLASS 9038 MECHANICAL ALTERNATOR - WIRING DIAGRAMS*



SINGLE PHASE MOTOR CONTROL



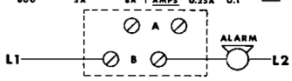
AC OPERATION OF MOTOR STARTERS

C65016-004-33

ELECTRICAL RATING OF ALARM SWITCH ONLY
CLASS 9007 TYPE AO1

AC PILOT DUTY		
VOLTS	BREAK	MAKE
110	15A	40A
220	10A	20A
440	6A	10A
600	5A	8A

D.C. PILOT DUTY SINGLE THROW			
VOLTS	115	220	600
AMPS	0.5 A	0.25A	0.05A
DOUBLE THROW			
VOLTS	115	220	600
AMPS	0.25A	0.1	—



CIRCUIT A CLOSES ON FALLING LIQUID LEVEL
CIRCUIT B CLOSES ON RISING LIQUID LEVEL
(SWITCH CONTACTS MUST BE SAME POLARITY)
FORM N5 HIGH LEVEL ALARM

C65016-004-33

- ☐ Mechanical Alternating Float Only FS-3
- ☐ Mechanical Alternating Float with HWA FS-3N5
- ☐ NEMA 1 Enclosure
- ☐ NEMA 4 Enclosure
- ☐ NEMA 7 Enclosure

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

FEDERAL PUMP MODEL : FS-3
MECHANICAL ALTERNATING FLOAT SWITCH

Complementary

Product destination	For open tank
Device mounting	Pedestal
Cable entry number	4 knock-outs for 1/2" or 3/4"conduit UL 508
Contacts type and composition	4 NC snap action DPST-DB Form YY
Controlled fluid	Corrosive fluid @ specific gravity of 0.85 in or higher Hydraulic oil @ specific gravity of 0.85 in or higher Sea water @ specific gravity of 0.85 in or higher Fresh water @ specific gravity of 0.85 in or higher
Motor power kW	0.37 kW 0.5 hp @ 230 V DC 0.37 kW 0.5 hp @ 115 V DC 0.18 kW 0.25 hp @ 32 V DC 0.75 kW 1 hp @ 475 V AC 3 phases 0.75 kW 1 hp @ 460 V AC 3 phases 3.7 kW 5 hp @ 230 V AC 3 phases 2.2 kW 3 hp @ 230 V AC 1 phase 2.2 kW 3 hp @ 115 V AC 3 phases 1.5 kW 2 hp @ 115 V AC 1 phase
Electrical connection	Screw-clamp terminals 10 AWG
Contact operation	Contacts close on liquid rise
Float movement	Variable adjustable
Float position	Any
Float rod angle	Vertical
Force down to trip	17 ozf at maximum adjustment 20 ozf at minimum adjustment
Force up to trip	16 ozf at maximum adjustment 18 ozf at minimum adjustment
Short circuit protection	20 A cartridge fuse gG
Local signalling	Without
Enclosure material	Painted cold-rolled steel
Operating position	Vertical position only
Electrical durability	100 cycles @ 60 cyc/mn
Mechanical durability	300 cycles
Terminal block type	8 terminals
Operating rate	60 cyc/mn
[Ui] rated insulation voltage	575 V UL 508
Terminals description ISO n°1	Line-load-load-line

Factory modification	Addition of a third, high-water alarm circuit (SPST-NO-DB)
Kit composition	Float switch Rod and float are to be choosen in accessories

Environment

Standards	CE UL 508
Ambient air temperature for operation	-22...220 °F
Ambient air temperature for storage	-22...220 °F
NEMA degree of protection	NEMA 1 UL 50
Product certifications	UL listed file E12158 CSA file LR25490

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

FEDERAL PUMP MODEL : FS-1 & 2: CLASS 9036GG-2
TWO POLE AUXILLARY FLOAT SWITCH
(Specified as emergency float switch back-up to Mechanical Alternating Switch)

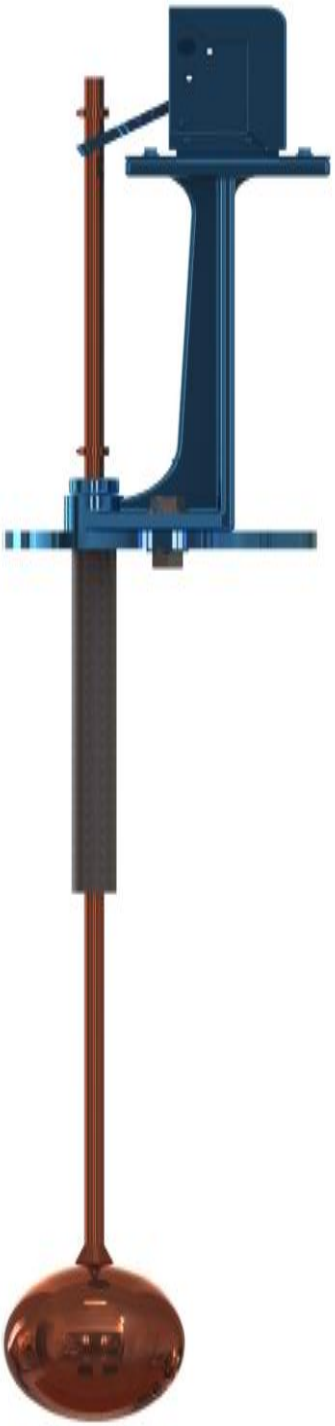


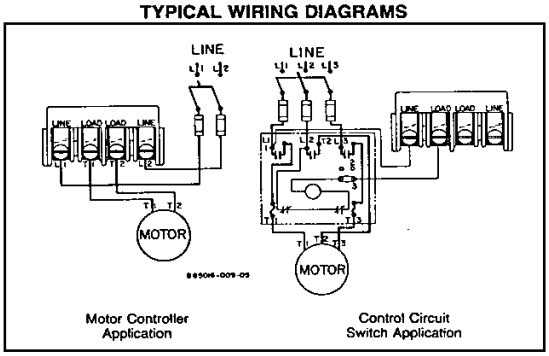
Table 1 Class 9035-9038 Electrical Ratings

Class	Type	Single Phase AC			Polyphase AC			DC			Control Circuit Rating
		115 V	230V	460/ 575V	115V	230V	460/ 575V	32V	115V	230V	
9035	DG,DR,DW30 (2 pole)	2 hp	3 hp	—	3 hp	5 hp	1 hp	.25 hp	.5 hp	.5 hp	A600
9035	DG,DR,DW31 (1 NO, 1 NC)	1 hp	1 hp	—	—	—	—	—	.25 hp	.25 hp	A300
9036	D (2 pole)	2 hp	3 hp	—	3 hp	5 hp	1 hp	.25 hp	.5 hp	.5 hp	A600
9036	G (2 pole)	2 hp	3 hp	5 hp	3 hp	5 hp	5 hp	.5 hp	1 hp	1 hp	A600
9036	G form H (1 NO, 1 NC)	1 hp	2 hp	2 hp	—	—	—	—	.5 hp	.5 hp	A300
9037	D, E, H (2 pole)	2 hp	3 hp	—	3 hp	5 hp	1 hp	.25 hp	.5 hp	.5 hp	A600
9037	G (2 pole)	2 hp	3 hp	5 hp	3 hp	5 hp	5 hp	.5 hp	1 hp	1 hp	A600
9037	G form H (1 NO, 1 NC)	1 hp	2 hp	2 hp	—	—	—	—	.5 hp	.5 hp	A300
9038	All (2 pole)	2 hp	3 hp	—	3 hp	5 hp	1 hp	.25 hp	.5 hp	.5 hp	A600

The following float switches are UL-listed under file E12158, guide NKPZ:

- Class 9035 Types DG, DW
- Class 9036 Types DG, DW, GG, GW
- Class 9037 Types DG, DW, EG, EW, GG, GW, HG, HW
- Class 9038 Types AG, AW, BG, BW, CG, CW, DG, DW, JG, JW

TYPICAL WIRING DIAGRAMS



TWO POLE ELECTRICAL RATINGS

Voltage	Single Phase AC	Polyphase AC	DC
115	2 HP	3 HP	1 HP
230	3 HP	5 HP	1 HP
460-575	5 HP	5 HP	—
32	—	—	1/2 HP

☐ NEMA 1 ☐ NEMA 7

☐ NEMA 4

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

FEDERAL PUMP MODEL : LLC-1H
Compression Type High Water Alarm Assembly-with horn

☐ NEMA 1 ☐ NEMA 4

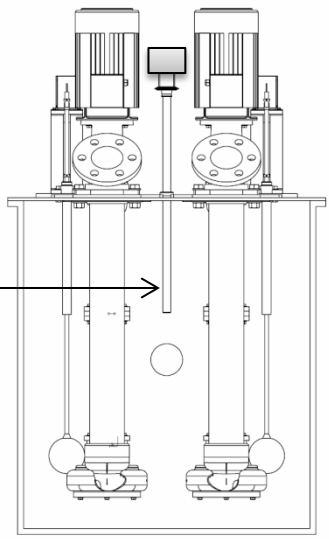
Alarm horn signals high water condition as water enters compression tube.

Contractor to provide “reliable” 115V single phase power to compression bell alarm.

HWA Compression tube sensor and associated alarm bell assembly bolts to pump cover plate (refer to dimensional drawing-cover plates-for specific location.

Mounting bracket bolts to steel cover plate.

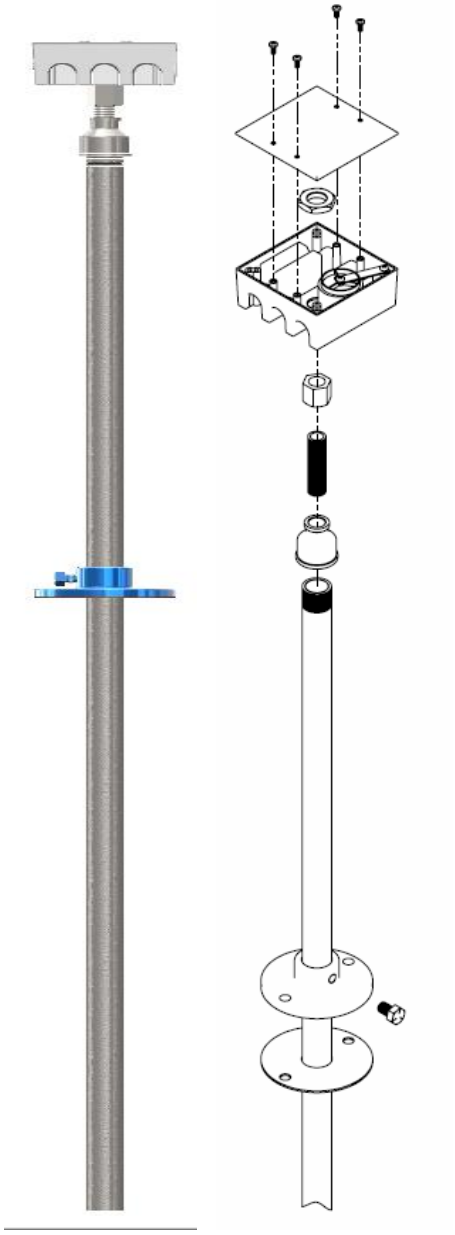
Compression tube extends into fiberglass basin
or concrete pit (shown on dimensional drawing)
Pump manufacturer to size basin upon basin depth.



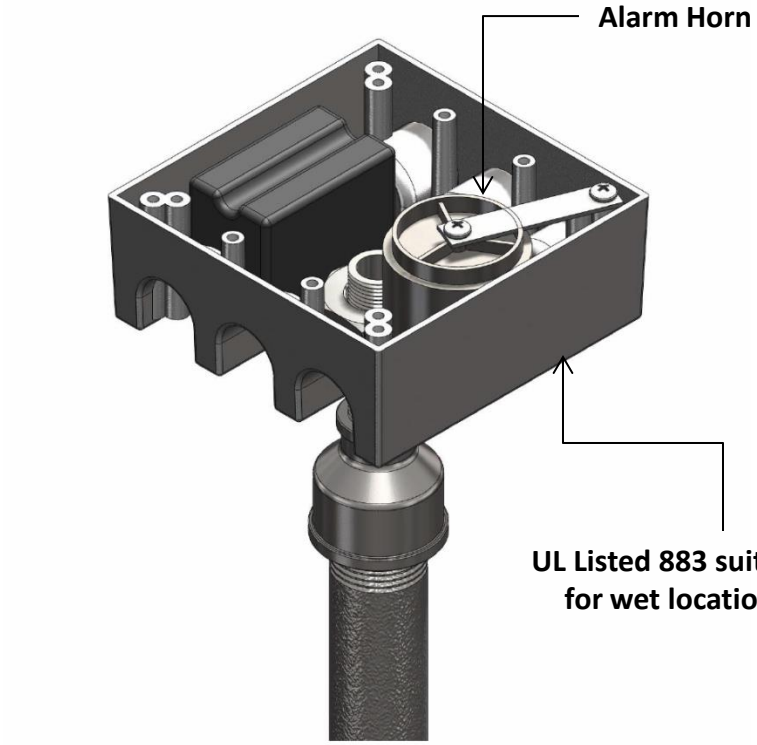
TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

FEDERAL PUMP MODEL : LLC-1H
Compression Type High Water Alarm Assembly-with horn

☐ NEMA 1 ☐ NEMA 4



Provide separate 115V "reliable" connection to compression high water alarm assembly for proper connection.

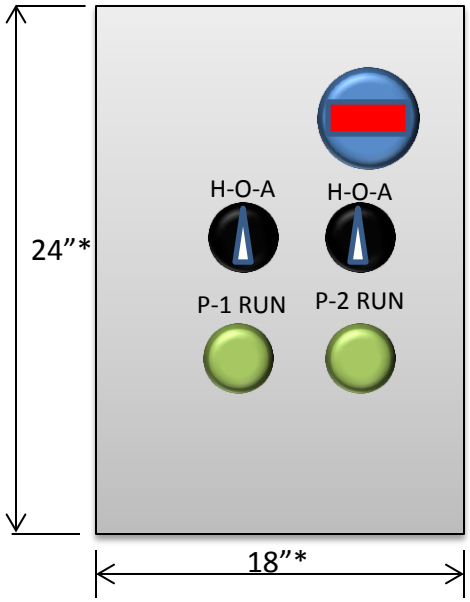


As liquid level rises above the set point, air in the tube is compressed and triggers a micro switch to sound the alarm horn. Set point is established in the field typically 3" below invert. The compression tube is placed in service at 3" below invert and the tube collar then tightened at that point.

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

D-1200 Duplex Controls with Mechanical Alternating Float

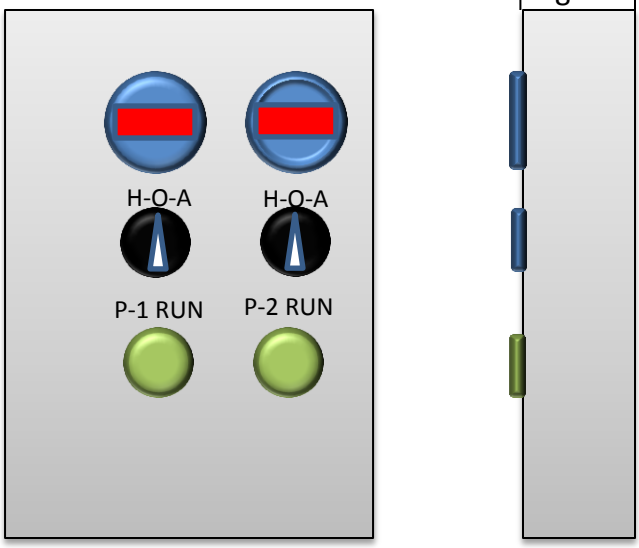
☐ Single Fused Disconnect



Federal Pump: D-1200A

- Single Fused Disconnect
- 120 V Control Transformer
- Across- the-line magnetic starters
- Starter Overload protection
- HOA Selector Switches
- Pump Run Lights

☐ Individual Pump Fused Disconnects



Federal Pump: D-1200B

- Individual Fused Disconnect
- 120 V Control Transformer
- Across- the-line magnetic starters
- Starter Overload protection
- HOA Selector Switches
- Pump Run Lights

☐ NEMA 1 ☐ NEMA 7

☐ NEMA 4

*Dimensions are approximate only and may vary based upon additional options or enclosure specified. For certified dimensions, contact the Factory prior to approval.

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Type S Simplex Control Panel-Options

Federal Pump: S-1000

- Across- the-line magnetic starter
- 120 V Control transformer
- Starter Overload protection
- HOA Selector Switch
- Pump Run Light

Preferred in smaller HP installations where simple and basic control s are required or where power disconnect switch is already in place for system.

Federal Pump: S-1100

- Single Un-Fused Disconnect
- 120 V Control Transformer
- Across- the-line magnetic starter
- Starter Overload protection
- HOA Selector Switch
- Pump Run Light

Preferred in smaller HP installations where simple and basic control s are required or where power disconnect switch is already in place but requires local thru the door disconnect as back up. Disconnect is not fused and used only as power interruption once opened.

Federal Pump: S-1200

- Single or individual Fused Disconnect
- 120 V Control Transformer
- Across- the-line magnetic starter
- Starter Overload protection
- HOA Selector Switch
- Pump Run Light

Preferred in typical installations where control requires local thru-the door power fused disconnect where other power disconnect switch do not exist locally.

Federal Pump: S-1300

- Single or individual Circuit Breaker Disconnect
- 120 V Control Transformer
- Across- the-line magnetic starter
- Starter Overload protection
- HOA Selector Switch
- Pump Run Light

Preferred in typical installations where control requires local thru-the door power disconnect switched where fuses are not desired and where other power disconnect switch do not exist locally.

*Dimensions are approximate only and may vary based upon additional options or enclosure specified. For certified dimensions, contact the Factory prior to approval.

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Type D Duplex Control Panel-Options

Federal Pump: D-1000
- Across- the-line magnetic starter
- 120 V Control transformer
- Starter Overload protection
- HOA Selector Switch

Preferred in smaller HP installations where simple and basic control s are required or where power disconnect switch is already in place for system.

Federal Pump: D-1100
- Single or individual Un-Fused Disconnect
- 120 V Control Transformer
- Across- the-line magnetic starter
- Starter Overload protection
- HOA Selector Switch

Preferred in smaller HP installations where simple and basic control s are required or where power disconnect switch is already in place but requires local thru the door disconnect as back up. Disconnect is not fused and used only as power interruption once opened.

Federal Pump: D-1200
- Single or individual Fused Disconnect
- 120 V Control Transformer
- Across- the-line magnetic starter
- Starter Overload protection
- HOA Selector Switch

Preferred in typical installations where control requires local thru-the door power fused disconnect where other power disconnect switch do not exist locally.

Federal Pump: D-1300
- Single or individual Circuit Breaker Disconnect
- 120 V Control Transformer
- Across- the-line magnetic starter
- Starter Overload protection
- HOA Selector Switch

Preferred in typical installations where control requires local thru-the door power disconnect switched where fuses are not desired and where other power disconnect switch do not exist locally.

*Dimensions are approximate only and may vary based upon additional options or enclosure specified. For certified dimensions, contact the Factory prior to approval.

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Control Panel Options

Federal Pump series SDT control panels are built to provide a number of options based upon the application and need of each installation. SDT controls include the following description and components for the basic units. Each can be modified with option listed below as required.

Control Type	Description	Control Enclosure Contains
S1000	Magnetic Starter with overload relays	Magnetic starter with overload relays only
S1100	S1000 with Unfused Disconnect Switch	Magnetic starter + Unfused disconnect switch
S1200	S1000 with Fused Disconnect Switch	Magnetic starter + Unfused disconnect switch
S1300	S1000 with Circuit Breaker	Magnetic starter + Circuit Breaker disconnect switch
D1000	Magnetic Starters with overload relays	(2) Magnetic starters with overload relays
D1100	D1000 with Unfused Disconnect Switches	(2) Magnetic starter + (2) Unfused disconnect switch
D1200	D1000 with Fused Disconnect Switches	(2) Magnetic starter + (2) Unfused disconnect switch
D1300	D1000 with Circuit Breaker Disconnect Switches	(2) Magnetic starter + (2) Circuit Breaker disconnect switch
T1000	Magnetic Starters with overload relays	(3) Magnetic starters with overload relays
T1100	T1000 with Unfused Disconnect Switches	(3) Magnetic starter + (3) Unfused disconnect switch
T1200	T1000 with Fused Disconnect Switches	(3) Magnetic starter + (3) Unfused disconnect switch
T1300	T1000 with Circuit Breaker Disconnect Switches	(3) Magnetic starter + (3) Circuit Breaker disconnect switch

Controls with power disconnect switches include thru-the-door disconnect handles require the disconnect switch(s) to be dis-engaged prior to opening the control panel door.

S1000, D1000 and T1000 do not include options for power disconnect. User to ensure local power disconnect switch(s) are available prior to selection of this option.

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Control Panel Options

Federal Pump series SDT control panels are built to provide a number of options based upon the application and need of each installation. List of the more common options are provided below. Other options are available upon request.

Option	Description	Control Enclosure Contains
	Hand-Off-Automatic Selector Switch (HOA) Or Test-Off-Automatic (TOA) in the panel cover for each starter.	Allows for the manual or automatic operation of each pump.
	Pilot light (pump-run-light) in the panel cover for each starter.	Allows for visual indication of each pump running.
	Control circuit transformer with 110 fused secondary for each control panel.	Reduces incoming 3 phase power to 110V for use with remote switches and for panel mounted options.
	Alarm section with common alarm horn, indicating light for each alarm and silence pushbutton in the panel cover.	Provides for individual alarm lights (for each alarm) and a single common alarm horn with a manual silence pushbutton.
	High Water Alarm Condition.	Used when the compression type high water alarm is not selected. Ensure separate high water alarm float switch or mechanical alternating float switch with high water alarm contact is specified.
	High temperature alarm condition	Used when influent is above 140 degree F and signals high temperature alarm condition. May also be used to initiate quench water device to cool influent below 140 degree F.
	Dry contacts for remote alarm signals.	Allows for contacts that, once engaged, provide signal for remote indication.
	Elapsed time meter in the panel cover for each starter	Provides for visual indication of each pump elapsed run time.
	Automatic pump alternator	Used when pumps are controlled with individual float switches and not a mechanical alternating float switch. Provides for lead/lag pump operation upon the completion of each pump cycle.

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

NEMA Control Panel Enclosures

The purpose of this document is to provide general information on the definitions of NEMA Enclosure Types to architects, engineers, installers, inspectors and other interested parties. [For more detailed and complete information, NEMA Standards Publication 250-2003, "Enclosures for Electrical Equipment (1000 Volts Maximum)" should be consulted. This Standards Publication as well as all other NEMA publications are available from IHS @ 800 854-7179 or http://www.global.ihs.com]

Type 1 Enclosures constructed for indoor use to provide a degree of protection to personnel against access to hazardous parts and to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt).

Type 2 Enclosures constructed for indoor use to provide a degree of protection to personnel against access to hazardous parts; to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt); and to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (dripping and light splashing).

Type 3 Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts; to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt and windblown dust); to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (rain, sleet, snow); and that will be undamaged by the external formation of ice on the enclosure.

Type 3R Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts; to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt); to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (rain, sleet, snow); and that will be undamaged by the external formation of ice on the enclosure.

Type 3S Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts; to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt and windblown dust); to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (rain, sleet, snow); and for which the external mechanism(s) remain operable when ice laden.

Type 3X Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts; to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt and windblown dust); to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (rain, sleet, snow); that provides an additional level of protection against corrosion and that will be undamaged by the external formation of ice on the enclosure.

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

NEMA Control Panel Enclosures

The purpose of this document is to provide general information on the definitions of NEMA Enclosure Types to architects, engineers, installers, inspectors and other interested parties. [For more detailed and complete information, NEMA Standards Publication 250-2003, "Enclosures for Electrical Equipment (1000 Volts Maximum)" should be consulted. This Standards Publication as well as all other NEMA publications are available from IHS @ 800 854-7179 or http://www.global.ihs.com]

Type 3SX Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts; to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt and windblown dust); to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (rain, sleet, snow); that provides an additional level of protection against corrosion; and for which the external mechanism(s) remain operable when ice laden.

Type 4 Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts; to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt and windblown dust); to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (rain, sleet, snow, splashing water, and hose directed water); and that will be undamaged by the external formation of ice on the enclosure.

Type 4X Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts; to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (windblown dust); to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (rain, sleet, snow, splashing water, and hose directed water); that provides an additional level of protection against corrosion; and that will be undamaged by the external formation of ice on the enclosure.

Type 5 Enclosures constructed for indoor use to provide a degree of protection to personnel against access to hazardous parts; to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt and settling airborne dust, lint, fibers, and flyings); and to provide a degree of rotection with respect to harmful effects on the equipment due to the ingress of water (dripping and light splashing).

Type 6 Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts; to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt); to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (hose directed water and the entry of water during occasional temporary submersion at a limited depth); and that will be undamaged by the external formation of ice on the enclosure.

Type 6P Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts; to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt); to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (hose directed water and the entry of water during prolonged submersion at a limited depth); that provides an additional level of protection against corrosion and that will be undamaged by the external formation of ice on the enclosure.

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

NEMA Control Panel Enclosures

The purpose of this document is to provide general information on the definitions of NEMA Enclosure Types to architects, engineers, installers, inspectors and other interested parties. [For more detailed and complete information, NEMA Standards Publication 250-2003, "Enclosures for Electrical Equipment (1000 Volts Maximum)" should be consulted. This Standards Publication as well as all other NEMA publications are available from IHS @ 800 854-7179 or http://www.global.ihs.com]

Type 12 Enclosures constructed (without knockouts) for indoor use to provide a degree of protection to personnel against access to hazardous parts; to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt and circulating dust, lint, fibers, and flyings); and to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (dripping and light splashing).

Type 12K Enclosures constructed (with knockouts) for indoor use to provide a degree of protection to personnel against access to hazardous parts; to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt and circulating dust, lint, fibers, and flyings); and to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (dripping and light splashing).

Type 13 Enclosures constructed for indoor use to provide a degree of protection to personnel against access to hazardous parts; to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt and circulating dust, lint, fibers, and flyings); to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (dripping and light splashing); and to provide a degree of protection against the spraying, splashing, and seepage of oil and non-corrosive coolants.

Type 7 Enclosures constructed for indoor use in hazardous (classified) locations classified as Class I, Division 1, Groups A, B, C, or D as defined in NFPA 70.

Type 8 Enclosures constructed for either indoor or outdoor use in hazardous (classified) locations classified as Class I, Division 1, Groups A, B, C, and D as defined in NFPA 70.

Type 9 Enclosures constructed for indoor use in hazardous (classified) locations classified as Class II, Division 1, Groups E, F, or G as defined in NFPA 70.

Type 10 Enclosures constructed to meet the requirements of the Mine Safety and Health Administration, 30 CFR, Part 18.

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Motor Enclosures

OPEN MOTOR
An open motor is one having ventilating openings which permit passage of external cooling air over and around the windings of the motor. The term “open” designates a motor having no restriction to ventilation other than that necessitated by mechanical construction.

DRIP-PROOF MOTOR
A drip-proof motor is an open motor in which the ventilating openings are so constructed that successful operation is not interfered with when drops of liquid or solid particles strike or enter the enclosure at any angle from 0 to 15 degrees downward from the vertical.

TOTALLY-ENCLOSED MOTOR
A totally enclosed motor is one so enclosed as to prevent the free exchange of air between the inside and outside of the case but not sufficiently enclosed to be termed air-tight.

TOTALLY-ENCLOSED NONVENTILATED MOTOR (TENV)
A totally enclosed non- ventilated motor is not equipped for cooling by means external to the enclosing parts.

TOTALLY-ENCLOSED FAN-COOLED MOTOR (TEFC)
A totally enclosed fan cooled motor is equipped for exterior cooling by means of a fan or fans integral to the motor but external to the enclosing parts.

EXPLOSION-PROOF MOTOR
An explosion proof motor’s enclosure is designed and constructed to withstand an explosion of a specified gas or vapor which may occur within it and to prevent the ignition of the specified gas or vapor surrounding the motor by sparks, flashes or explosions of the specified gas or vapor which may occur within the motor casing.

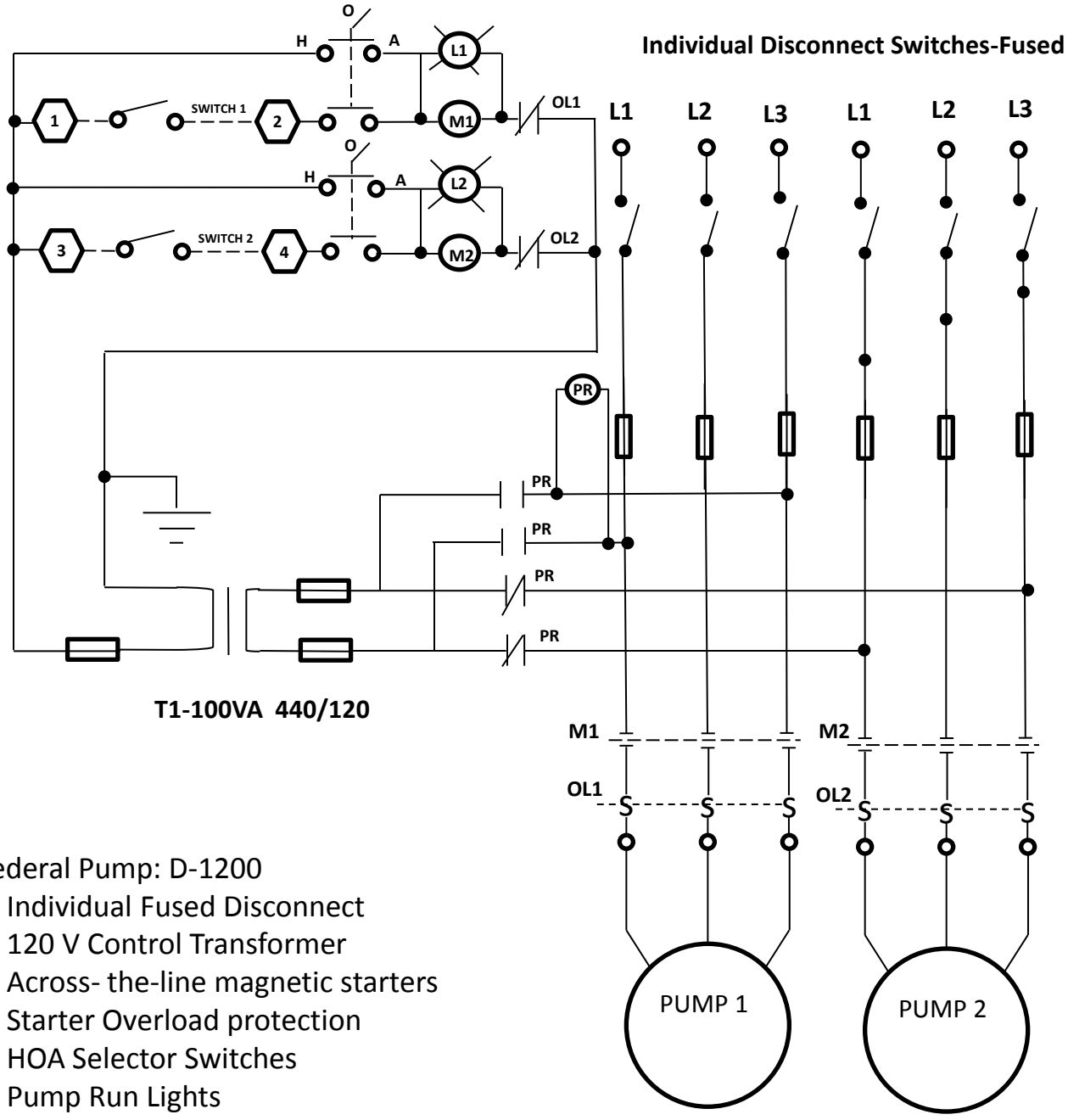
DUST-IGNITIONPROOF MOTOR
A dust-ignition proof motor is a totally-enclosed motor whose enclosure is designed and constructed in a manner which will exclude ignitable amounts of dust or amounts which might affect performance or rating, and which will not permit arcs, sparks, or heat otherwise generated or liberated inside the enclosure to cause ignition of exterior accumulations or atmospheric suspensions of a specific dust on or in the vicinity of the enclosure.

TOTALLY-ENCLOSED FAN-COOLED GUARDED MOTOR
A totally-enclosed fan-cooled guarded motor is a totally-enclosed fan-cooled motor in which all openings giving direct access to the fan are limited in size by the design of the structural parts or by screens, grilles, expanded metal, etc., to prevent accidental contact with the fan. Such openings shall not permit the passage of a cylindrical rod 0.75 inch in diameter and a probe shall not contact the blades, spokes or other irregular surfaces of the fan.

TOTALLY-ENCLOSED AIR-OVER MOTOR
A totally-enclosed air-over motor is intended for exterior cooling by a ventilating means external to the motor.

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

D-1200 Duplex Controls with Mechanical Alternating Float

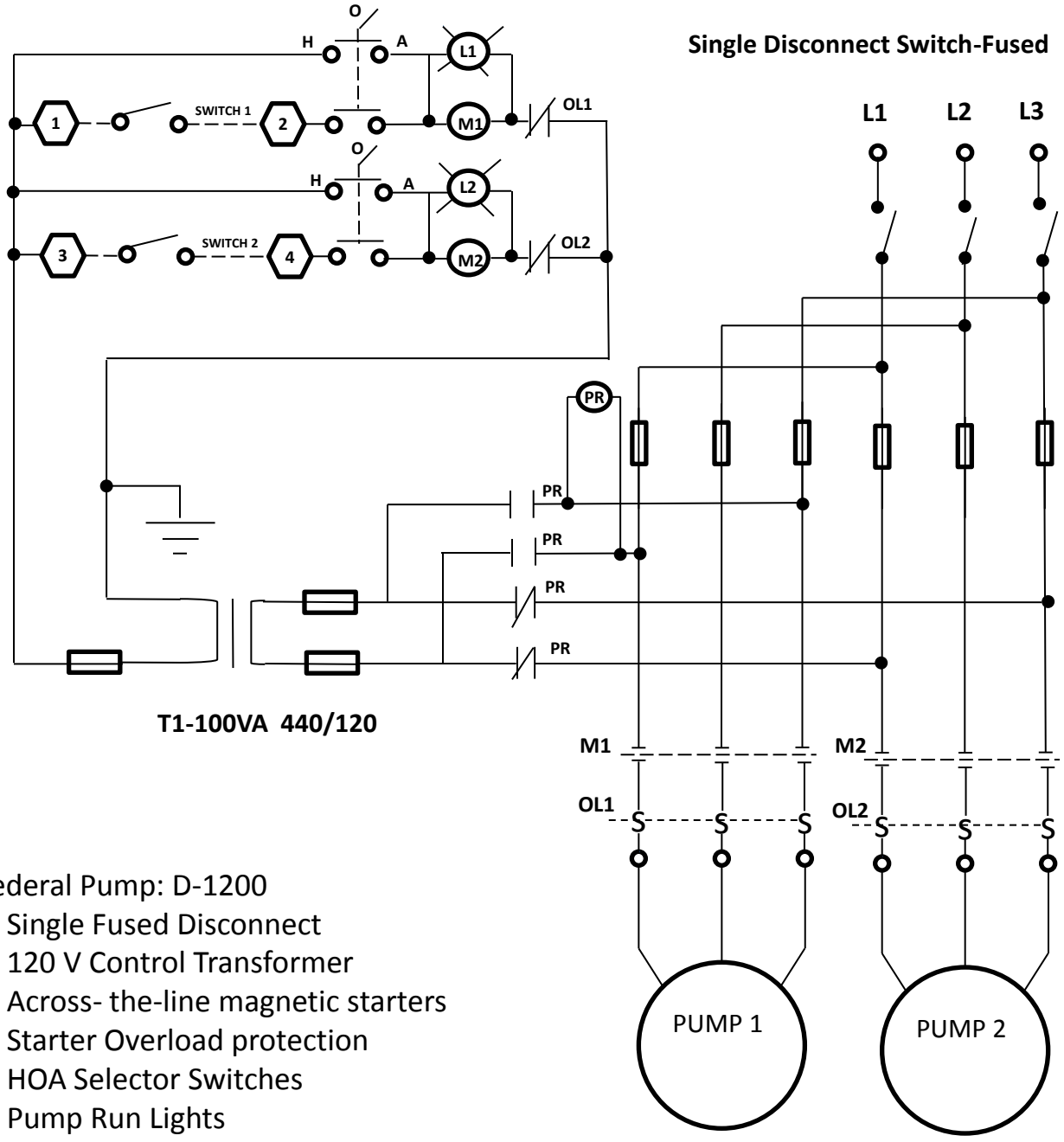


Federal Pump: D-1200

- Individual Fused Disconnect
- 120 V Control Transformer
- Across- the-line magnetic starters
- Starter Overload protection
- HOA Selector Switches
- Pump Run Lights

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

D-1200 Duplex Controls with Mechanical Alternating Float



Federal Pump: D-1200

- Single Fused Disconnect
- 120 V Control Transformer
- Across- the-line magnetic starters
- Starter Overload protection
- HOA Selector Switches
- Pump Run Lights

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Electric Motor Data**

HP	RPM (Nominal)	Full Load Efficiency (3 Phase Motors) %	Full Load Amps 115V Single Phase	Full Load Amps 230V Single Phase	Full Load Amps 208V Three Phase	Full Load Amps 230 V Three Phase	Full Load Amps 460V Three Phase
0.75	1800	74	14	7	3.3	3	1.5
1	1800	82.5	16	8	3.6	3.2	1.6
1.5	1800	84	20	10	5.3	4.8	2.4
2	1800	84	24	12	6.9	6.2	3.1
3	1800	87.5	34	17	9.3	8.4	4.2
5	1800	87.5	56	28	15	13.6	6.8
7.5	1800	89.5	80	40	22	20.2	10.1
10	1800	89.5	100	50	30	27	13.5
15	1800	91			41	37	18.5
20	1800	91			56	50	25
25	1800	92.4			67	60	30
30	1800	92.4			80	72	36
40	1800	93			104	94	47

** Motor data may vary by manufacturer. Above information is provided as a general guideline only based upon ODP construction. Refer to Factory for certified electric motor operating characteristics.

FEDERAL PUMP CORP

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

Submission Date	
Approval Date	
Release Date	
Start-Up date	

SUBMITTAL DATA SUMMARY

Item	Description
Project Name	
Project Address	
Pump Item No	
Customer Name	
Customer PO	
Pump Tag	
Equipment No.	
System Type	
Model No (each pump)	
GPM	
TDH	
Motor HP	
RPM	
Voltage/Phase	
Motor Enclosure	
Basin Depth	
Basin Size	
Basin Type	
Cover Size	
Frame Size	
Electric Controls	
Float Type	
Float Enclosure	
High Water Alarm Type	
Control Panel Type	

TYPE VSA: SUSPENDED WET PIT SEWAGE EJECTOR

REPLACEMENT PARTS KIT

Bolt Kit
- All bolts in pump model
- All gaskets for the pump model.

Coupling Kit
- Coupling Insert
- Pump shaft key
- Motor shaft key
- Coupling halves
- Coupling guard-mesh

Shaft Kit
- Bearing Kit
- Coupling Kit
- New pump shaft
- Impeller Key

Impeller Kit
- Case gasket
- Impeller Key
- Bolt Kit
- Discharge Pipe Adapter Seals

Seal Kit:
- Bolt Kit
- Lower Shaft seal
- Pedestal Shaft seal
- Adapter seal-discharge pipe

Motor Kit
- Coupling Insert
- Pump shaft key
- Motor shaft key
- Coupling guard-mesh
- Replacement Motor

Replacement Discharge Pipe Kit
- Discharge Pipe
- Pipe Adapter Seals
- Discharge Elbow
- Bolt Kit

Thrust bearing Kit
- Coupling Kit
- Upper Thrust bearing and Bearing Seals
- Bolt Kit
- Thrust bearing grease fitting

Bearing Kit:
- Bolt Kit
- Seal Kit
- Lower sleeve bearing
- Intermediate bearing
- Thrust ball bearing
- Bearing Grease Compression Fittings
- Grease fitting assembly

Overhaul Kit:
- Bearing Kit
- Coupling Kit
- Shaft Kit
- Impeller Kit

Replacement Column Legs
- Bearing Kit
- Replacement Column Leg

Federal Pump provides pre-engineered replacement parts kits to assist in the repair or overhaul of your Federal Pump. Each kit contains the components required to complete the specific task at hand with factory authorized and designed components providing original equipment manufactured parts to ensure long life and lasting quality.

The overhaul and repair of the Federal Pump should be reviewed with a qualified Federal Pump sales representative to ensure the installation and product usage meets the product specification requirements prior to ordering the replacement parts kits.

Each kit will be supplied with section drawing and detail of the kit components to allow for ease in selection and repair