

.....  
TYPE  
.....  
**VSP**

## HEAVY DUTY SUMP PUMPS

**photo  
coming  
soon**

Horsepower range 1/4 thru 20,  
capacities to 500 GPM, Heads to 88'.  
discharge size 2" thru 4", 1750 and 1150  
operation.

### HIGHLIGHTS

- ⌘ Heavy Duty
- ⌘ Capacities to 500 G.P.M.
- ⌘ Pumping Heads to 88 feet
- ⌘ 2" thru 4" pump sizes
- ⌘ Vertical submerged design
- ⌘ Single and duplex units
- ⌘ Pit Covers available
- ⌘ Sump Basins available
- ⌘ Automatic controls
- ⌘ Pump Sizing data

## FEATURES

**MOTOR:** Nationally known manufacture. Single phase motors in fractional horsepower frame sizes have built-in overload protection. Other motors should be protected by magnetic starters.

**FLEXIBLE COUPLING:** Machined and balanced.

**THRUST BEARING:** Ball bearing mounted above suspension plate in dust-proof and moisture-proof housing.

**ADJUSTING NUTS:** Two bronze lock nuts for accurate vertical adjustment of impeller clearance.

**SUSPENSION PLATE:** Cast iron plate has integral strengthening ribs.

**DISCHARGE PIPE:** Steel, locked to suspension plate and terminates with a 45 degree elbow above the plate.

**IMPELLER:** One-piece, bronze or cast iron, balanced, keyed and locked to shaft.

**SHAFT:** Carbon steel, turned and ground, sized for maximum load.

**SUSPENSION LEG:** Heavy steel pipe fully encloses the shaft.

**GUIDE BEARINGS:** Renewable bronze sleeve type intermediate guide bearing for each four feet of unsupported shaft length plus bottom guide bearing in pump casing.

**CASING:** Cast iron with smooth water passages.

**LUBRICATION SYSTEM:** Intermediate guide bearings are grease lubricated through flexible grease lines. Bottom guide bearings are water or grease lubricated, depending on the pit depth and the pump frame size. Alemite fittings are furnished above the suspension plate for grease lines.

**BASINS AND PITS:** Sump basins of fiberglass or steel construction are available. Also, steel covers and grouting frames for concrete pits.

## MODIFICATIONS LIST

**DISCHARGE CONNECTION:** Under-cover tee connections; special top discharge connections.

**MATERIALS OF CONSTRUCTION:** Non-standard impeller material; stainless steel shaft; all-bronze or all-iron pump; galvanized steel discharge pipe.

**LUBRICATION SYSTEM:** Solenoid operated water flush for guide bearings.

**NON-STANDARD MOTORS:** Totally enclosed or explosion-proof housings; special electrical ratings; other modifications.

## SUGGESTED SPECIFICATIONS FOR ARCHITECTS AND ENGINEERS:

Furnish and install as shown on plans a duplex VSP- \_\_\_\_\_, vertical submerged sump pump unit as manufactured by Federal Pump Corporation. Each pump shall be rated \_\_\_\_\_ G.P.M. at \_\_\_\_\_ feet Total Dynamic Head, shall have a \_\_\_\_\_ inch discharge and be built for a pit or basin \_\_\_\_\_ deep.

Shafts to be carbon steel, turned and ground; impellers to be bronze (or cast iron), hydraulically and dynamically balanced. Thrust ball bearing shall be fully enclosed in a dust and moisture-proof housing mounted above the suspension plate. Pump casing shall include a renewable sleeve bearing with required means of lubrication. Renewable intermediate guide bearings shall be furnished where pit depth requires.

Impellers shall be sized for the exact capacity and head specified and shall be fully non-overloading at the H.P. specified throughout the entire range of operation.

Motors shall be \_\_\_\_\_ H.P., \_\_\_\_\_ phase, \_\_\_\_\_ cycle, \_\_\_\_\_ volts, \_\_\_\_\_ R.P.M. open, drip-proof ball bearing type, flexibly coupled to pumps. Furnish a pedestal mounted alternating float switch to alternate the operation of the pumps and provide simultaneous operation when required.

Furnish a pedestal mounted auxiliary float switch to turn on both pumps if the alternating float switch is inoperative. The float switches shall have copper floats, brass rods, adjustable stops, galvanized rod guides and shall be equal to Federal Type FS-4.

Furnish a compression tube type high water alarm with integral horn, equal to Federal Type FS-5.

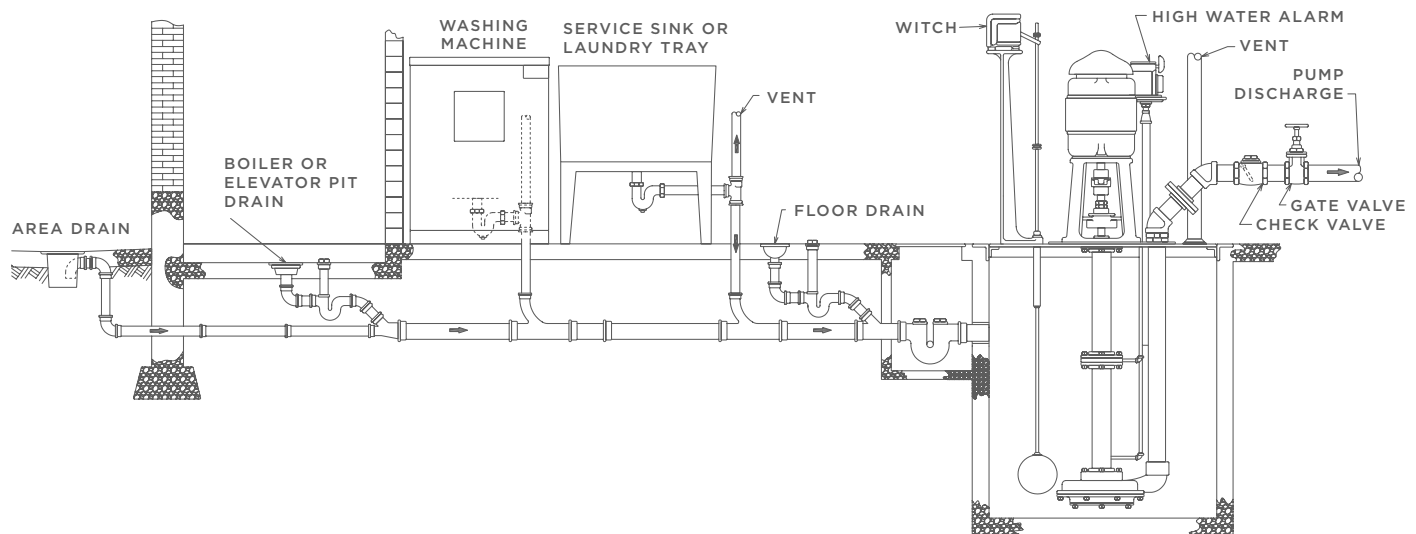
Furnish for each motor a magnetic line voltage starter in wall-mounting general purpose enclosure providing overload and low voltage protection and with a Hand-Off-Automatic selector switch in the cover.

Furnish a welded angle iron pit frame and heavy steel cover equal to Federal Type PF-1 for a concrete pit \_\_\_\_\_ x \_\_\_\_\_ x \_\_\_\_\_ deep. The cover and frame are to be treated with a corrosion resistant coating. Cover shall have required openings for pumps, controls, manhole and vent connection.

### ALTERNATE FOR BASIN:

Furnish a fiberglass (or steel) sump basin \_\_\_\_\_ diameter x \_\_\_\_\_ deep with an inlet connection as determined by job conditions. The basin shall have a steel cover with required openings for pumps, controls, manhole and vent connection and shall be treated with a corrosion resistant coating.

## INSTALLATION DIAGRAM



## PUMP SIZING DATA

### PUMP CAPACITY

#### Inflow Rates

Drainage from tile footing

(sandy soil).....2 GPM per 100 sq. ft.

Drainage from tile footing

(clay soil).....1 GPM per 100 sq. ft.

Run-off from roofs or paved areas

Maximum rainfall over 15-minute period, from Weather Bureau  
(60 gal. run-off per 1" of rainfall per 100 sq. ft.)

Bldg. located within 1,000 ft. of river or lake..... add 20% to  
inflow rate.

Basement floor more than 3-ft. below sewer level... add 10% to  
inflow rate per foot in excess of 3 ft.

### EXAMPLE

Determine the pump capacity of a sump pump to handle tile  
footing draining an area 40' x 100' (4,000 sq. ft.) of sandy soil  
and roof drains for the same area. Maximum rainfall for a  
15-minute period is 1/2"

Inflow from tile footing

(40 x 2 GPM) ..... 80 GPM

Inflow from roof area

(40 x 1/2 of 60/15 minutes).....80 GPM

Total inflow.....160 GPM

Pump capacity

(total inflow x 1.2)..... 192 GPM

(Pump capacity applies to a single pump or to each pump of a  
duplex unit.)

### PUMP DISCHARGE HEAD

The discharge head for a sump pump installation consists of the  
following elements:

#### STATIC HEAD

The difference in elevation between the lowest water level in the  
sump pit, and the maximum height of the discharge line.

#### FRICTION

Loss of head in the discharge line, including valves and other  
fittings.

#### BACK PRESSURE

Proper allowance must be made for back pressure in the sewer  
line, if existing.

### EXAMPLE

Sump pit 5' in depth to be set in the ground, with top flush with  
finished floor. Basement floor 10' below highest point of  
discharge line. Sump pump capacity 50 GPM. Size of discharge  
line 3".

Static Head..... 14ft.\*

Friction Head:

Discharge line.....2ft.

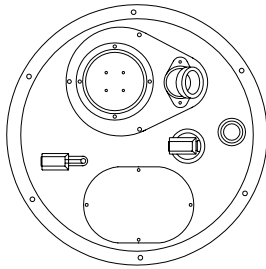
valves and other fittings.....2ft.

Back Pressure.....5ft.

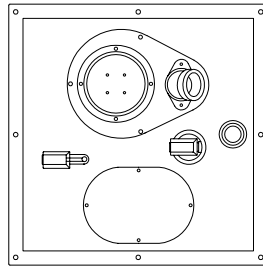
Total Dynamic Head.....23ft.

\*Lowest water level estimated to be 1 ft. above bottom of sump pump.

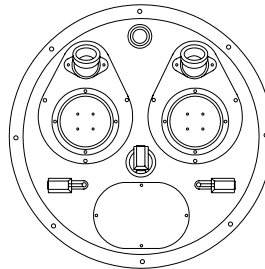
## PIT & BASIN COVERS



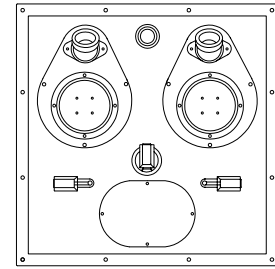
Simplex Unit  
Round Pit or Basin



Simplex Unit  
Square Pit

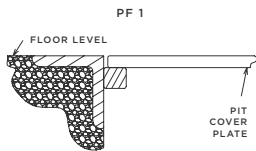


Simplex Unit  
Round Pit or Basin



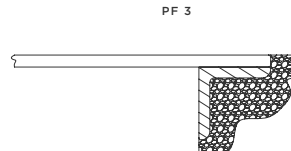
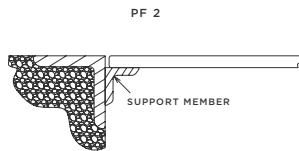
Simplex Unit  
Square Pit

## TYPES OF GROUTING FRAMES FOR CONCRETE PITS



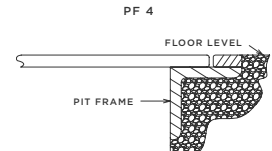
**Type PF-1** furnished as standard for square and rectangular pits. Permits frame and cover to be installed flush with finished floor. Has bar support for cover.

**Type PF-2** construction same as PF-1 except with angle iron support for cover.

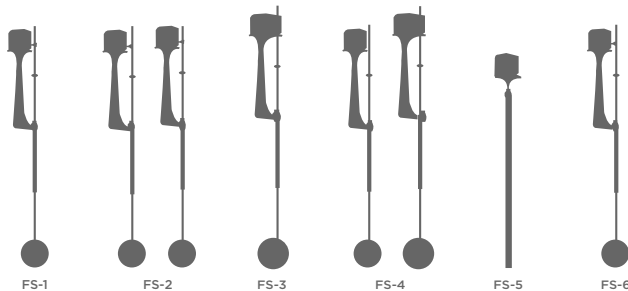


**Type PF-3** furnished as standard for round pits. Frame supports cover and should be recessed into concrete so that cover is flush with finished floor.

**Type PF-4** construction same as PF-3 except with filler strip. Frames and covers are treated with corrosion resistant coating, and are available in non-standard shapes and sizes, sectional construction, and galvanized or checked steel.



## CONTROL EQUIPMENT



### PUMP CONTROLS

The following control arrangements are available:

**FS-1** (for single unit) one float switch for start-stop control.

**FS-2** (for duplex unit) two float switches for start-stop control. The switches can be manually set to change the lead pump. Both pumps will operate if the in-flow rate requires.

**FS-3** (for duplex unit) - one alternating float switch which operates the two pumps on an alternating basis and turns on both pumps simultaneously if the in-flow rate requires.

**FS-4** (for duplex unit) - one alternating float switch (as described immediately above) plus two-pole emergency auxiliary float switch which will turn on both pumps at a predetermined high water level if the alternating float switch fails to operate for some reason.

**FS-5** (for single or duplex unit) - a compression tube type high water alarm actuating switch with integral alarm horn. Can also provide signal for remote alarm indication. Alarm panel with bell, indicating light and silencing button is also available.

**FS-6** (for single or duplex unit) - one float switch to act as a high water alarm actuator instead of the compression tube type described immediately above.



### MOTOR CONTROLS

The following control arrangements are available:

**For single or duplex units:** (1) magnetic starter for each motor to be mounted on an adjacent wall or on the float switch pedestal(s).

**For duplex units:** A Type D Duplex Control Panel in a single enclosure for mounting on an adjacent wall. These panels are available as follows:

**D1000:** (2) magnetic starters in one enclosure.

**D1100:** (2) magnetic starters and (2) unfused disconnect switches in one enclosure.

**D1200:** (2) magnetic starters and (2) fusible disconnect switches in one enclosure.

**D1300:** (2) magnetic starters and (2) circuit breakers in one enclosure.

Modifications are available for magnetic starters and Type D Duplex Panels as follows: special enclosures, 'Hand-off-Automatic' selector switches, pilot lights, control circuit transformers, manual transfer switch and automatic pump alternator.

Selection Table 1750 RPM				
Unit No.	G.P.M.	Disch. Head (ft.)	Motor H.P.	Disch. Size (ins.)
VSP-2A-.5-4	15	30	0.5	2
VSP-2A-.75-4		41	0.75	2
VSP-2A-1-4		52	1	2
VSP-2C-1.5-4		59	1.5	2
VSP-2A-.5-4	30	28	0.5	2
VSP-2A-.75-4		35	0.75	2
VSP-2A-1-4		47	1	2
VSP-2A-1.5-4		52	1.5	2
VSP-2C-2-4	40	65	2	2
VSP-2A-.5-4		26	0.5	2
VSP-2A-.75-4		32	0.75	2
VSP-2A-1-4		42	1	2
VSP-2A-1.5-4	50	50	1.5	2
VSP-2C-2-4		62	2	2
VSP-2A-.5-4		23	0.5	2
VSP-2A-.75-4		30	0.75	2
VSP-2A-1-4	60	38	1	2
VSP-2A-1.5-4		47	1.5	2
VSP-2C-2-4		58	2	2
VSP-2A-.5-4		21	0.5	2
VSP-2A-.75-4	75	24	0.75	2
VSP-2A-1-4		35	1	2
VSP-2A-1.5-4		45	1.5	2
VSP-2C-2-4		51	2	2
VSP-2A-.5-4	100	17	0.5	2
VSP-2A-.75-4		22	0.75	2
VSP-2A-1-4		27	1	2
VSP-2A-1.5-4		40	1.5	2
VSP-2C-2-4	125	46	2	2
VSP-2C-3-4		56	3	2
VSP-2A-.5-4		10	0.5	2
VSP-2A-.75-4		15	0.75	2
VSP-2A-1-4	150	20	1	2
VSP-2A-1.5-4		29	1.5	2
VSP-2C-2-4		42	2	2
VSP-2C-3-4		52	3	2
VSP-3F-.75-4	200	12	0.75	3
VSP-3F-1-4		19	1	3
VSP-3F-1.5-4		26	1.5	3
VSP-3F-2-4		33	2	3
VSP-3C-3-4	250	50	3	3
VSP-3F-1-4		16	1	3
VSP-3F-1.5-4		23	1.5	3
VSP-3F-2-4		31	2	3
VSP-3C-3-4	300	42	3	3
VSP-3C-5-4		66	5	3
VSP-3F-1-4		7	1	3
VSP-3F-1.5-4		13	1.5	3
VSP-3F-2-4	350	25	2	3
VSP-3F-3-4		29	3	3
VSP-3K-3-4		34	3	3
VSP-3K-5-4		50	5	3
VSP-3K-7.5-4	400	55	7.5	3
VSP-3L-7.5-4		61	7.5	3
VSP-3F-1.5-4		10	1.5	3
VSP-3F-2-4		16	2	3
VSP-3F-3-4	500	25	3	3
VSP-3K-5-4		36	5	3
VSP-3K-7.5-4		52	7.5	3
VSP-3L-10-4		65	10	3
VSP-4K-2-4	300	88	15	3
VSP-4K-3-4		11	2	4
VSP-4K-5-4		23	3	4
VSP-4K-7.5-4		35	5	4
VSP-4L-10-4	350	48	7.5	4
VSP-4L-15-4		71	10	4
VSP-4K-3-4		85	15	4
VSP-4K-5-4		20	3	4
VSP-4K-7.5-4	400	32	5	4
VSP-4L-7.5-4		35	7.5	4
VSP-4L-10-4		47	7.5	4
VSP-4L-15-4		65	10	4
VSP-4K-3-4	500	80	15	4
VSP-4K-5-4		18	3	4
VSP-4K-7.5-4		25	5	4
VSP-4L-7.5-4		30	7.5	4
VSP-4L-10-4	500	42	7.5	4
VSP-4L-15-4		61	10	4
VSP-4L-20-4		75	15	4
VSP-4L-5-4	500	23	5	4
VSP-4L-7.5-4		36	7.5	4
VSP-4L-10-4		55	10	4
VSP-4L-15-4		71	15	4
VSP-4L-20-4		81	20	4

Selection Table 1150 RPM				
Unit No.	G.P.M.	Disch. Head (ft.)	Motor H.P.	Disch. Size (ins.)
VSP-2A-.25-6	15	18	0.33	2
VSP-2A-.33-6		23	0.5	2
VSP-2A-.5-6		36	0.75	2
VSP-2C-1-6		42	1	2
VSP-2A-.25-6	30	13	0.25	2
VSP-2A-.33-6		17	0.33	2
VSP-2A-.5-6		22	0.5	2
VSP-2C-.75-6		35	0.75	2
VSP-2C-1-6	40	41	1	2
VSP-2A-.25-6		11	0.25	2
VSP-2A-.33-6		14	0.33	2
VSP-2A-.5-6		22	0.5	2
VSP-2C-.75-6	50	33	0.75	2
VSP-2C-1-6		40	1	2
VSP-2A-.25-6		10	0.25	2
VSP-2A-.33-6		13	0.33	2
VSP-2A-.5-6	60	18	0.5	2
VSP-2C-.75-6		30	0.75	2
VSP-2C-1-6		38	1	2
VSP-2A-.25-6		6	0.25	2
VSP-2A-.33-6	75	12	0.33	2
VSP-2A-.5-6		14	0.5	2
VSP-2C-.75-6		24	0.75	2
VSP-2C-1-6		30	1	2
VSP-2C-1.5-6	100	38	1.5	2
VSP-2A-.33-6		9	0.33	2
VSP-2A-.5-6		12	0.5	2
VSP-2C-.75-6		22	0.75	2
VSP-2C-1-6	125	29	1	2
VSP-2C-1.5-6		37	1.5	2
VSP-2C-.75-6		16	0.75	2
VSP-2C-1-6		24	1	2
VSP-3F-.75-6	150	33	1.5	2
VSP-3K-1-6		14	0.75	3
VSP-3K-1.5-6		18	1	3
VSP-3F-.75-6		25	1.5	3
VSP-3F-1-6	200	9	0.75	3
VSP-3K-1.5-6		13	1	3
VSP-3K-2-6		21	1.5	3
VSP-3L-3-6		25	2	3
VSP-3L-5-6	250	33	3	3
VSP-3K-1-6		42	5	3
VSP-3K-1.5-6		10	1	3
VSP-3L-2-6		16	1.5	3
VSP-3L-3-6	300	22	2	3
VSP-3L-5-6		31	3	3
VSP-3L-1.5-6		40	5	3
VSP-3L-2-6		14	1.5	3
VSP-3L-3-6	350	19	2	3
VSP-3L-5-6		27	3	3
VSP-4L-1.5-6		37	5	3
VSP-4L-2-6	400	11	1.5	4
VSP-4L-3-6		15	2	4
VSP-4L-5-6		25	3	4
VSP-4L-7.5-6		33	5	4
VSP-4L-1-6	500	13	2	4
VSP-4L-3-6		21	3	4
VSP-4L-5-6		30	5	4
VSP-4L-7.5-6		12	2	4
VSP-4L-3-6	500	20	3	4
VSP-4L-5-6		27	5	4
VSP-4L-7.5-6		15	3	4
VSP-4L-10-6		23	5	4

**\* Explanation of unit numbers:**

Example VSP-2A-.75-4: VSP is the type of pump (vertical suspended heavy duty sump pump); -2 is the discharge size (2 inches); A is the volute size (A = small volute; C and F = medium volute; K and L = large volute); -.75 is the motor horsepower; and -4 is the motor speed (-4 = 4-pole 1750 RPM; -6 = 6-pole 1150 RPM)

**DIMENSIONS:** subject to change and should not be used for construction purposes unless certified, All dimensions are in inches unless otherwise noted.

**SIMPLEX AND DUPLEX UNITS:** While the dimension drawing on this page shows a duplex unit in a basin, the data on the drawing applies to simplex and duplex units.

**INLETS:** Basins can be furnished with any number of inlets, of the styles shown on this page in sizes 2 inches thru 8 inches. The inlet depth is determined by job conditions such as distance from farthest fixture and pipe pitch. Indicate size, style and depth of inlet in the boxes provided on the drawing, when releasing the basin for fabrication. Unless otherwise requested, the inlet centerline is directly below the centerline of the manhole.

**COVERS:** All basin covers are steel. Covers for cast iron and fiberglass basins are bolted onto the top flange of the basin. Covers for steel basins are welded onto the basin shell and therefore, there is no top flange. Basin covers have required openings for pumps and controls plus a vent connection and a manhole (with a cast iron manhole cover). The standard vent connection for a sump pit or basin cover is a 2 inch screwed connection. If local code requires a large vent connection, it must be so specified when the unit is ordered. Covers are furnished with bolts and gasketing for gas-tight field assembly on the basin. Pumps are furnished with bolts and gasketing for gastite field assembly on the cover.

SECTIONAL BASINS:

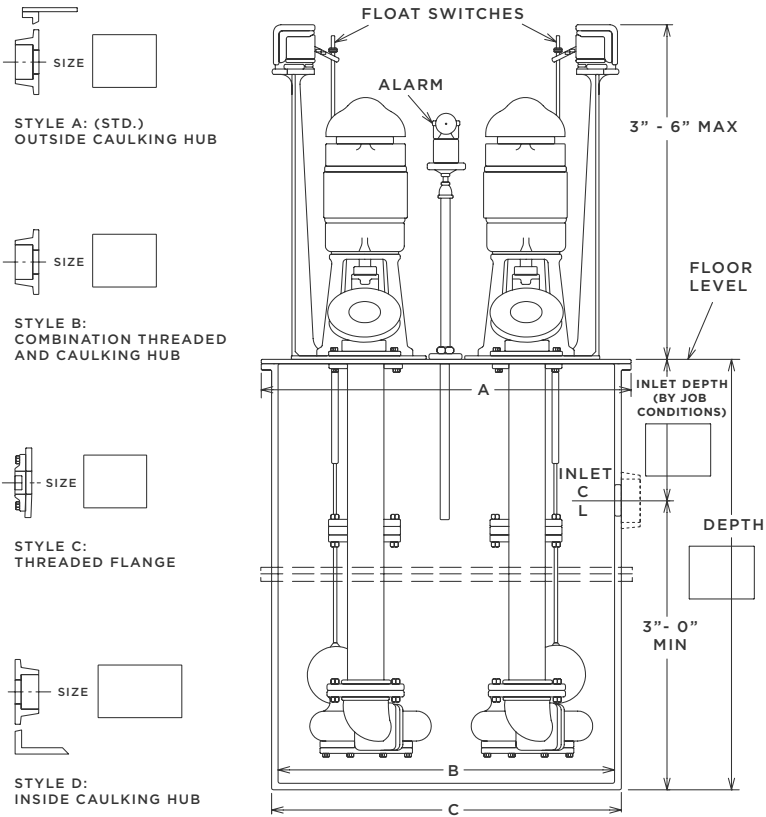
Standard steel and fiberglass basins are built in one section. Multi-section basins are furnished only when specified. Standard cast iron basins are built in one, two, three or more sections, depending on the basin depth. The intermediate flanges of multi-section basins have the same outside diameter and bolt hole dimensions as the top flange on which the cover is mounted. Bolts and gasketing are furnished for field assembly of the sections.

**SQUARE BASINS:** Square and rectangular basins are available in steel construction only. Cast Iron and fiberglass basins are not available in these shapes.

**SIZING THE BASIN:** In most cases the basin diameter can be the minimum shown in the table on this page, and the depth should be sufficient to allow three feet below the inlet connection. If job conditions require a shallower basin, increase the diameter. The pumping cycle can be determined from the volume of water between the inlet connection and a line one foot above the bottom of the basin.

**CONCRETE PIT:** VSP pumps can be furnished with cover plates and grouting frames for concrete sump pits. (see duplex cover layouts)

**STEEL BASINS:** VSP sump pumps can be furnished with basins of heavy welded steel construction. The dimension drawing and inlet connections drawing also apply to steel basins, except for the A dimension (top basin flange).



Dimensions Table						
Basin Dimensions				Top Flange and Mating Flanges of Cast Iron Basins Fiberglass Basins		
B Basin Inside Dia.	Approx. Gals. Per Ft. Of Depth	A Cover Dia.	C Approx.	No. Of Tappings	Bolt Size	Bolt Circle Diameter
18	13	22	19	4	0.375	20
24	24	28	25	4	0.375	26.5
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

Recommended Minimum Pit & Basin Sizes				
Pump Model	Round		Square	
	Simplex	Duplex	Simplex	Duplex
VSP-2A	30" DIA.	36" DIA.	24 X 24"	36 X 36"
VSP-2C AND 3C	30" DIA.	42" DIA.	30 X 30"	36 X 36"
VSP-3F AND 4F	30" DIA.	42" DIA.	30 X 30"	36 X 36"
VSP-3K AND 4K	30" DIA.	42" DIA.	30 X 30"	42 X 42"
VSP-3L AND 4L	36" DIA.	48" DIA.	36 X 36"	48 X 48"

