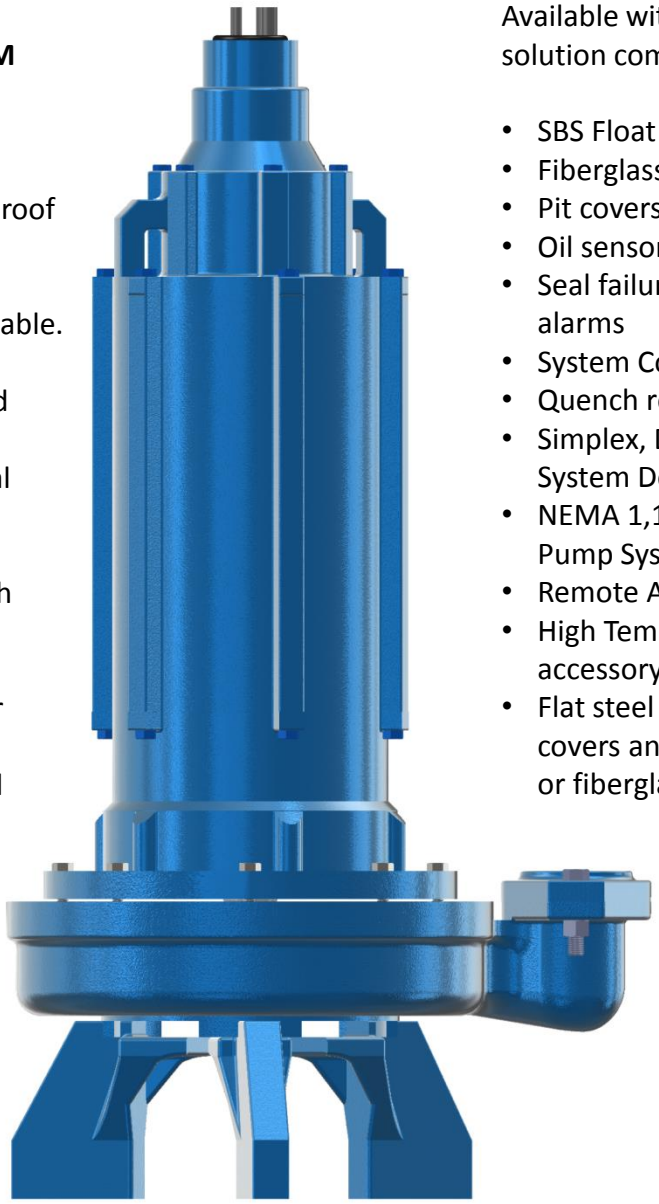
FEDERAL PUMP CORP
1144 Utica Ave, Brooklyn, NY 11203

Series VSS-2.5 D
High Head Submersible Sump Pump
July 2015 New Catalogue Release
Bulletin 229F.01

VSS-2 ½ D HIGH HEAD SUMP PUMP
FREE STANDING

- **Flows to 200 GPM.**
- **TDH to 95 Feet at 1750 RPM**
- Free Standing or Guide Rail Design.
- Available in Standard Submersible or Explosion Proof Design.
- Provided with 25 feet of submersible motor power cable.
- Cast Iron case and motor enclosure with bronze fitted impeller.
- Motor winding with thermal sensors for motor overload protection.
- Select sizes available in high temperature ratings to 195 degree F .
- Dual mechanical seal motor protection.
- Special all bronze liquid end available for special applications.



Available with pump system solution components including:

- SBS Float Control System
- Fiberglass Basins
- Pit covers and frames
- Oil sensor probes
- Seal failure detection and alarms
- System Control Panels
- Quench relief system controls
- Simplex, Duplex and Triplex System Designs.
- NEMA 1,12 and 4 UL-508 Pump System Controls
- Remote Alarm Panel Systems
- High Temperature system accessory components.
- Flat steel or hinged aluminum covers and frames for concrete or fiberglass basin designs .

Free Standing Design.
Ease in retrofitting existing systems.
Ease in installation.

Cast Iron support stands are “free standing “ design requiring no foundation bolts. Pumps can be provided with Federal Pump Series SBS Simplex or Duplex Control Panels and float controls upon request.

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VSS-2.5 D SELECTION TABLE

1750 RPM

Unit NO.	GPM	DISCHARGE HEAD (Feet)	Motor HP
VSS-2.5D-1-4	25	46	1
VSS-2.5D-1.5-4	25	60	1.5
VSS-2.5D-2-4	25	76	2
VSS-2.5D-3-4	25	87	3
VSS-2.5D-5-4	25	92	5
VSS-2.5D-1-4	50	39	1
VSS-2.5D-1.5-4	50	49	1.5
VSS-2.5D-2-4	50	68	2
VSS-2.5D-3-4	50	84	3
VSS-2.5D-5-4	50	90	5
VSS-2.5D-1-4	75	28	1
VSS-2.5D-1.5-4	75	42	1.5
VSS-2.5D-2-4	75	56	2
VSS-2.5D-3-4	75	78	3
VSS-2.5D-5-4	75	86	5
VSS-2.5D-7.5-4	75	92	7.5
VSS-2.5D-1.5-4	100	32	1.5
VSS-2.5D-2-4	100	45	2
VSS-2.5D-3-4	100	66	3
VSS-2.5D-5-4	100	83	5
VSS-2.5D-7.5-4	100	90	7.5
VSS-2.5D-2-4	125	33	2
VSS-2.5D-3-4	125	53	3
VSS-2.5D-5-4	125	76	5
VSS-2.5D-7.5-4	125	86	7.5

1750 RPM

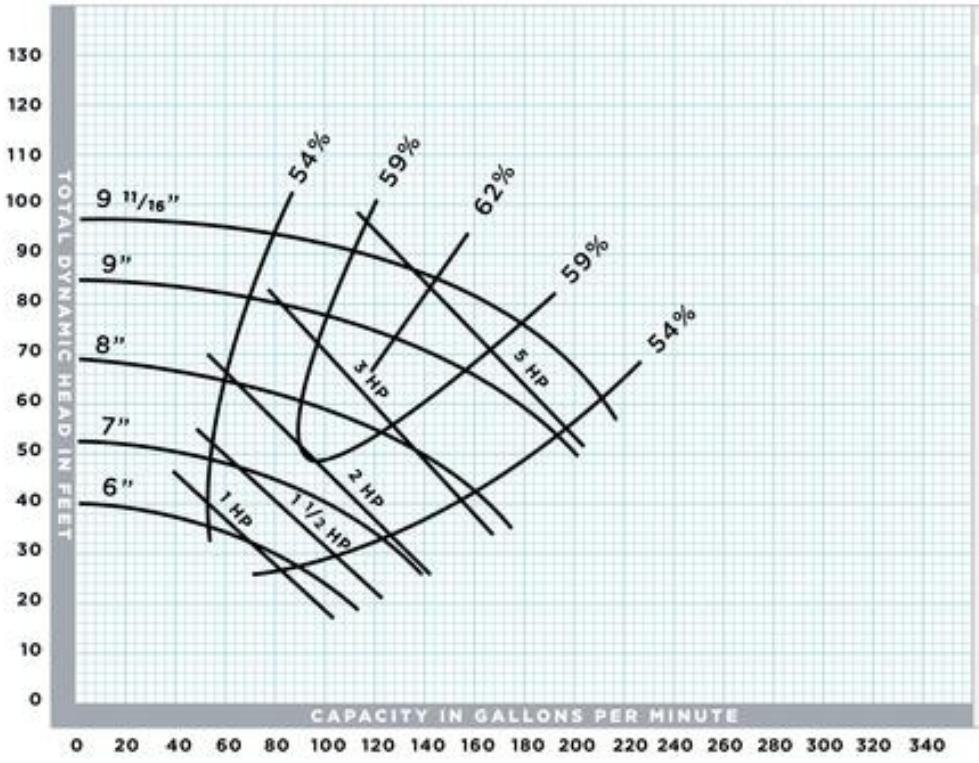
Unit NO.	GPM	DISCHARGE HEAD (Feet)	Motor HP
VSS-2.5D-3-4	150	43	3
VSS-2.5D-5-4	150	72	5
VSS-2.5D-7.5-4	150	82	7.5
VSS-2.5D-5-4	175	64	5
VSS-2.5D-7.5-4	175	74	7.5

1150 RPM

VSS-2.5D-1/2-6	25	26	0.5
VSS-2.5D-3/4-6	25	35	0.75
VSS-2.5D-1-6	25	40	1
VSS-2.5D-1.5-6	25	43	1.5
VSS-2.5D-1/2-6	50	22	0.5
VSS-2.5D-3/4-6	50	28	0.75
VSS-2.5D-1-6	50	34	1
VSS-2.5D-1.5-6	50	41	1.5
VSS-2.5D-3/4-6	75	22	0.75
VSS-2.5D-1-6	75	28	1
VSS-2.5D-1.5-6	75	34	1.5
VSS-2.5D-2-6	75	38	2
VSS-2.5D-1-6	100	22	1
VSS-2.5D-1.5-6	100	32	1.5
VSS-2.5D-2-6	100	36	2
VSS-2.5D-1.5-6	125	27	1.5
VSS-2.5D-2-6	125	32	2

All pumps provided with threaded 2.5” Discharge connection.

1750 RPM

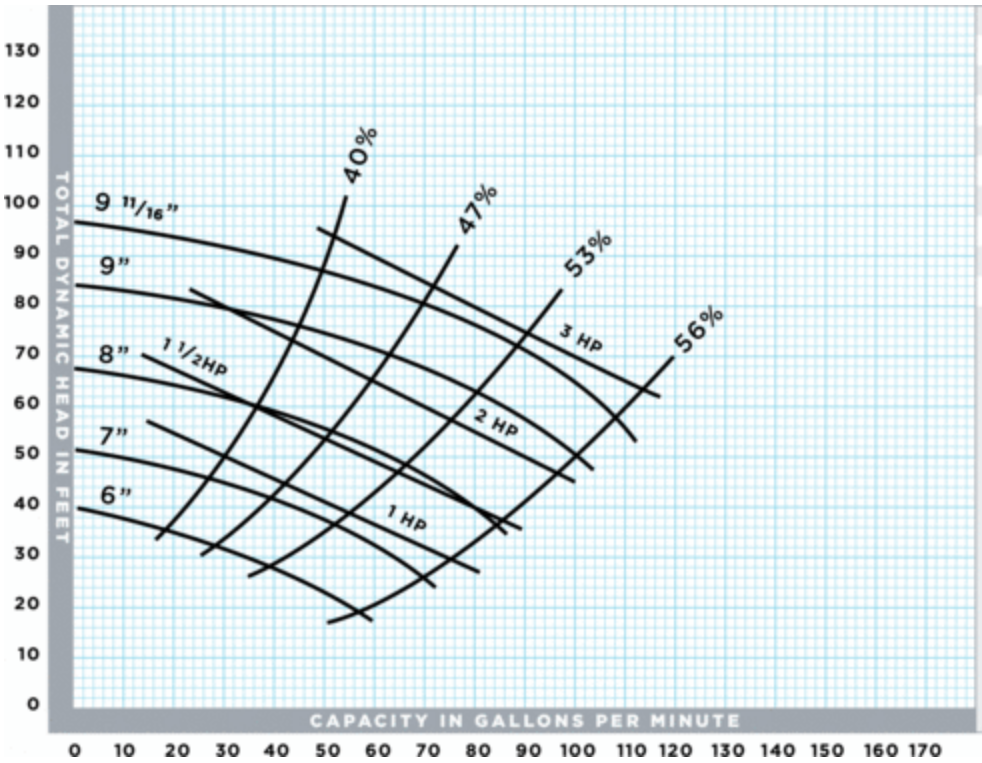


TYPE VSS-2 1/2 D
SUBMERSIBLE SUMP PUMPS
BULLETIN 208

Section 3
Curve Page VSS-2 1/2 D-1
July, 1992

1750 RPM
MODEL: VSS-2 1/2 D
DISCHARGE SIZE: 2 1/2"
IMPELLER: VSS-2 1/2D-2-7.5

This performance curve represents the VSS-1 1/2D-2-7.5 impeller with a 3/8" wide vane at 9" diameter.



TYPE VSS-2 1/2 D
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Curve Page VSS-2 1/2 D-1
July, 1992

1750 RPM
MODEL: VSS-2 1/2 D
DISCHARGE SIZE: 2 1/2"
IMPELLER: VSS-2 1/2D-2-7.5

This performance curve represents the VSS-1 1/2D-2-7.5 impeller with a 3/16" wide vane at 9" diameter.

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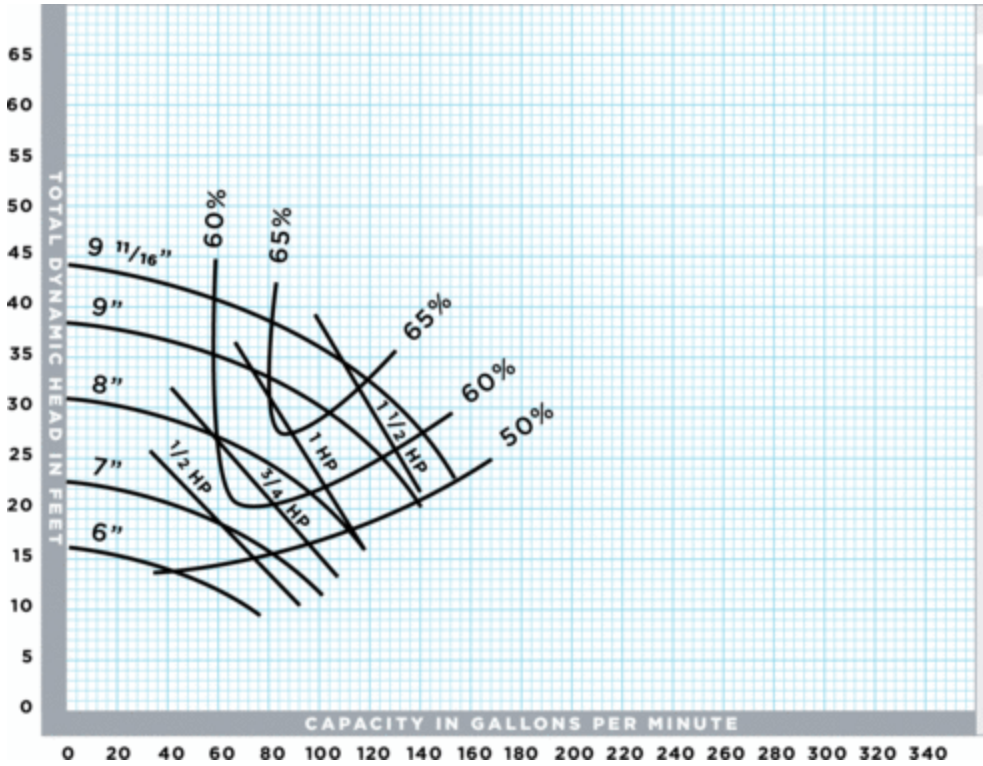
1150 RPM

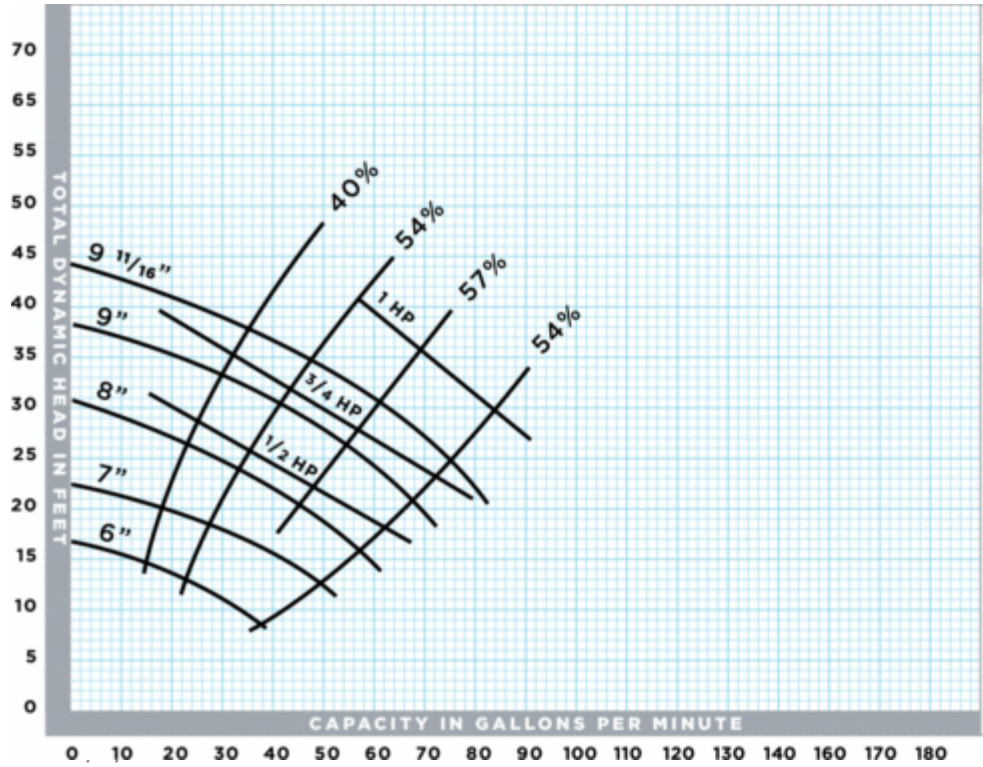


TYPE VSS-2 1/2 D
SUBMERSIBLE SUMP PUMPS
BULLETIN 208

Section 3
Curve Page VSS-2 1/2 D-2
July, 1992

1150 RPM
MODEL: VSS-2 1/2 D
DISCHARGE SIZE: 2 1/2"
IMPELLER: VSS-2 1/2 D-2-7.5

This performance curve represents the VSS-2 1/2 D-2-7.5 impeller with a 3/8 wide vane at 9" diameter.



TYPE VSS-2 1/2 D
SUBMERSIBLE SUMP PUMPS
BULLETIN 208

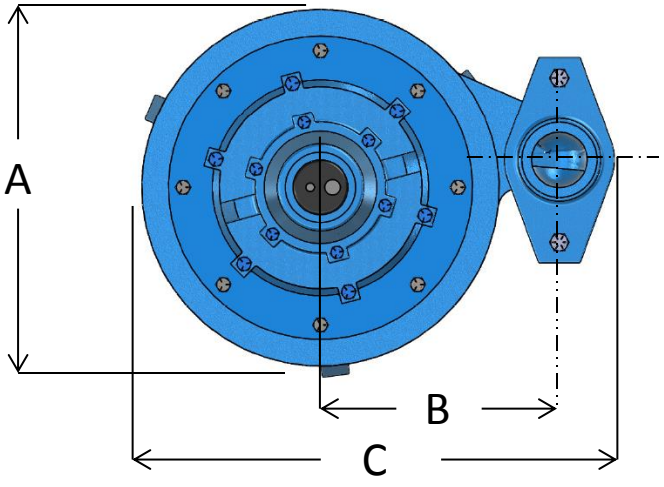
Section 3
Curve Page VSS-2 1/2 D-2
July, 1992

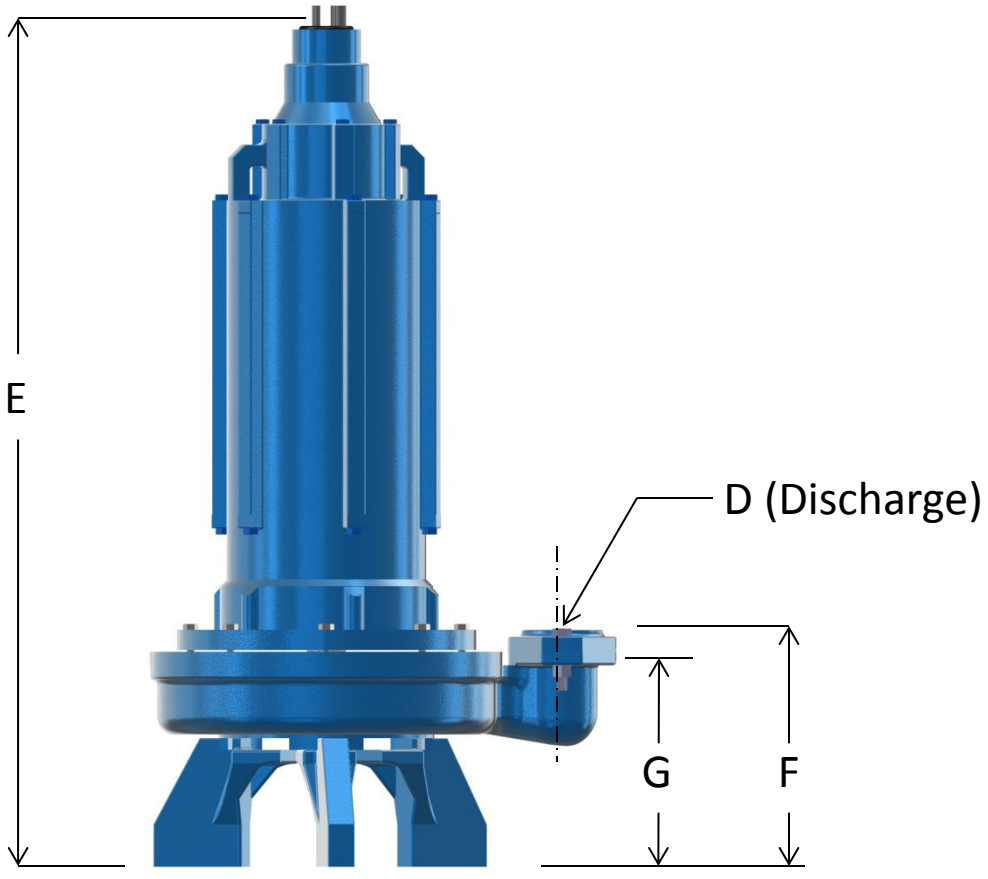
1150 RPM
MODEL: VSS-2 1/2 D
DISCHARGE SIZE: 2 1/2"
IMPELLER: VSS-2 1/2 D-2-7.5

This performance curve represents the VSS-2 1/2 D-2-7.5 impeller with a 3/16 wide vane at 9" diameter.

DIMENSIONS

DIMENSIONS





Dimensions* (inches) 1750 RPM Motor

Motor HP	Motor Frame	A	B	C	D	E	F	G
1	140TY	13	8 1/2	17 3/8	2 1/2	34	8 1/2	6 7/8
1.5	140TY	13	8 1/2	17 3/8	2 1/2	34	8 1/2	6 7/8
2	140TY	13	8 1/2	17 3/8	2 1/2	34	8 1/2	6 7/8
3	140TY	13	8 1/2	17 3/8	2 1/2	34	8 1/2	6 7/8
5	180TY	13	8 1/2	17 3/8	2 1/2	35	8 1/2	6 7/8
7.5	180TY	13	8 1/2	17 3/8	2 1/2	35	8 1/2	6 7/8

Dimensions* (inches) 1150 RPM Motor

Motor HP	Motor Frame	A	B	C	D	E	F	G
3/4	140TY	13	8 1/2	17 3/8	2 1/2	34	8 1/2	6 7/8
1	140TY	13	8 1/2	17 3/8	2 1/2	34	8 1/2	6 7/8
1.5	140TY	13	8 1/2	17 3/8	2 1/2	34	8 1/2	6 7/8
2	140TY	13	8 1/2	17 3/8	2 1/2	34	8 1/2	6 7/8

* ***Dimensions are in inches. Subject to change without notice.***

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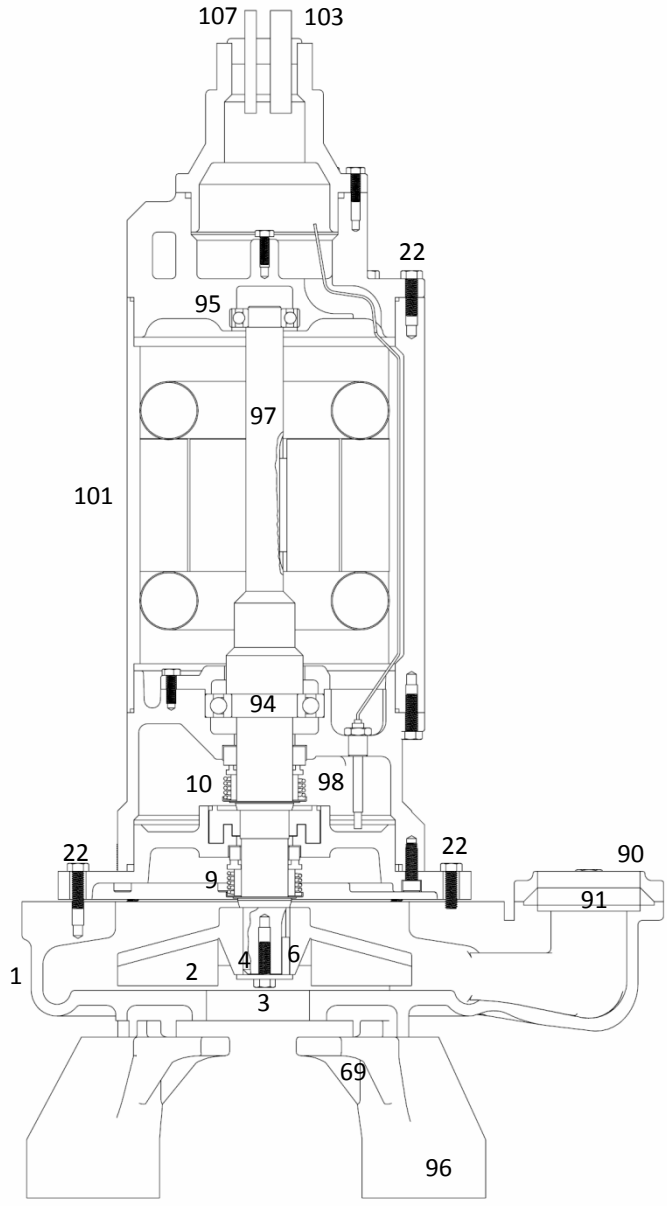
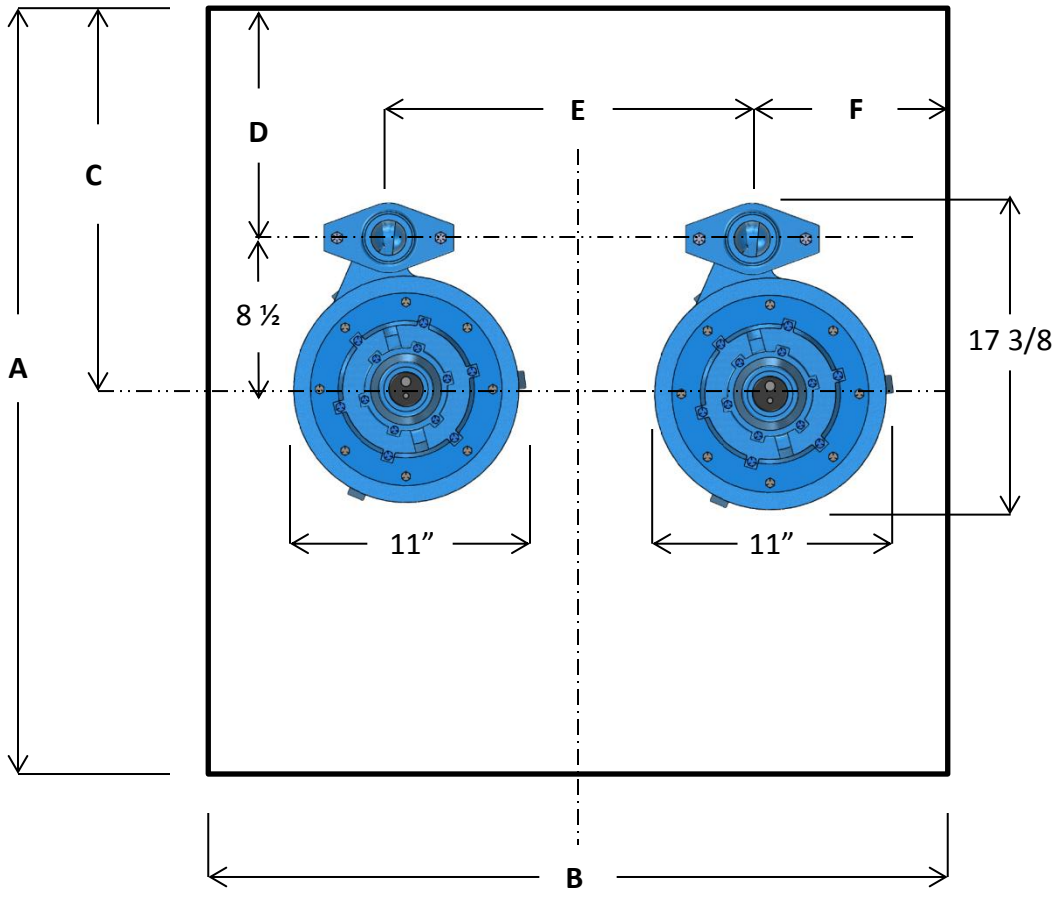


For major motor component parts, contact Federal Pump.

Pump Component Parts List

Item	Description	Material
1	Casing	Cast iron
2	Impeller	Bronze
3	Impeller Lock Screw	St. Steel
4	Impeller Washer	St Steel
6	Impeller Key	Steel
9	Outer Seal	Carbon/Ceramic
10	Inner Seal	Carbon/Ceramic
22	Cap Screw	Steel
69	Washer	Steel
90	Discharge Flange	Cast Iron
91	Discharge Pipe gasket	Rubber
94	Lower Bearing	Ball Bearing
95	Upper Bearing	Ball Bearing
96	Stand Legs	Cast Iron
97	Pump/Motor Shaft	St Steel
98	Moisture Probe	St Steel
101	Motor Housing	Cast Iron
103	Power Cable	Neoprene
107	Seal Sensor cable	Neoprene

Sample Duplex Pump set



Square Concrete Pit –Suggested Dimensions-Drawing not to Scale

Size	A	B	C	D	E	F
36 X 36	36	36	18	9 1/2	28	4
42 X 42	42	42	20	11 1/2	30	6
48 X 48	48	48	24	15 1/2	32	8
60 X 60	60	60	30	21 1/2	40	10

Suggested Specifications: Top Mounted Mechanical Float Controls

Furnish and install where shown in the plans and as may be detailed in the equipment schedule a Duplex Sump Pump system as manufacturered by Federal Pump Model 2.5 D VSS submersible sump pump. Each Duplex Sump Pump system shall be provided with the following components (shipped loose for field assembly)

(2) Submersible sump pumps of cast iron bronze fitted construction each provided with dual mechanical seals with a single outboard and single inboard seal for dual motor protection. Pumps shall be assembled and tested in Brooklyn, NY and provided with moisture sensing probes to sense the presence of water that may enter the lower seal chamber area. Moisture sensor probes will terminate pump operation and sound alarm. Each pump will be provided with 25 feet of submersible pump power cable with internal epoxy sealed leads and grommets preventing water intrusion into the submersible motors. Motors shall not exceed 1750 RPM.

(1) Duplex steel non-traffic bearing cover and frame assembly sized for the concrete pit as shown in the plans.

(1) Mechanical alternating float switch, NEMA 1 Enclosure, designed for automatic operation of lead and lag pump and alternate lead/lag pump after completion of each pump cycle. Provide (1) auxiliary stand by float assembly to provide bac-up redundant service if the mechanical alternating float switch should fail.

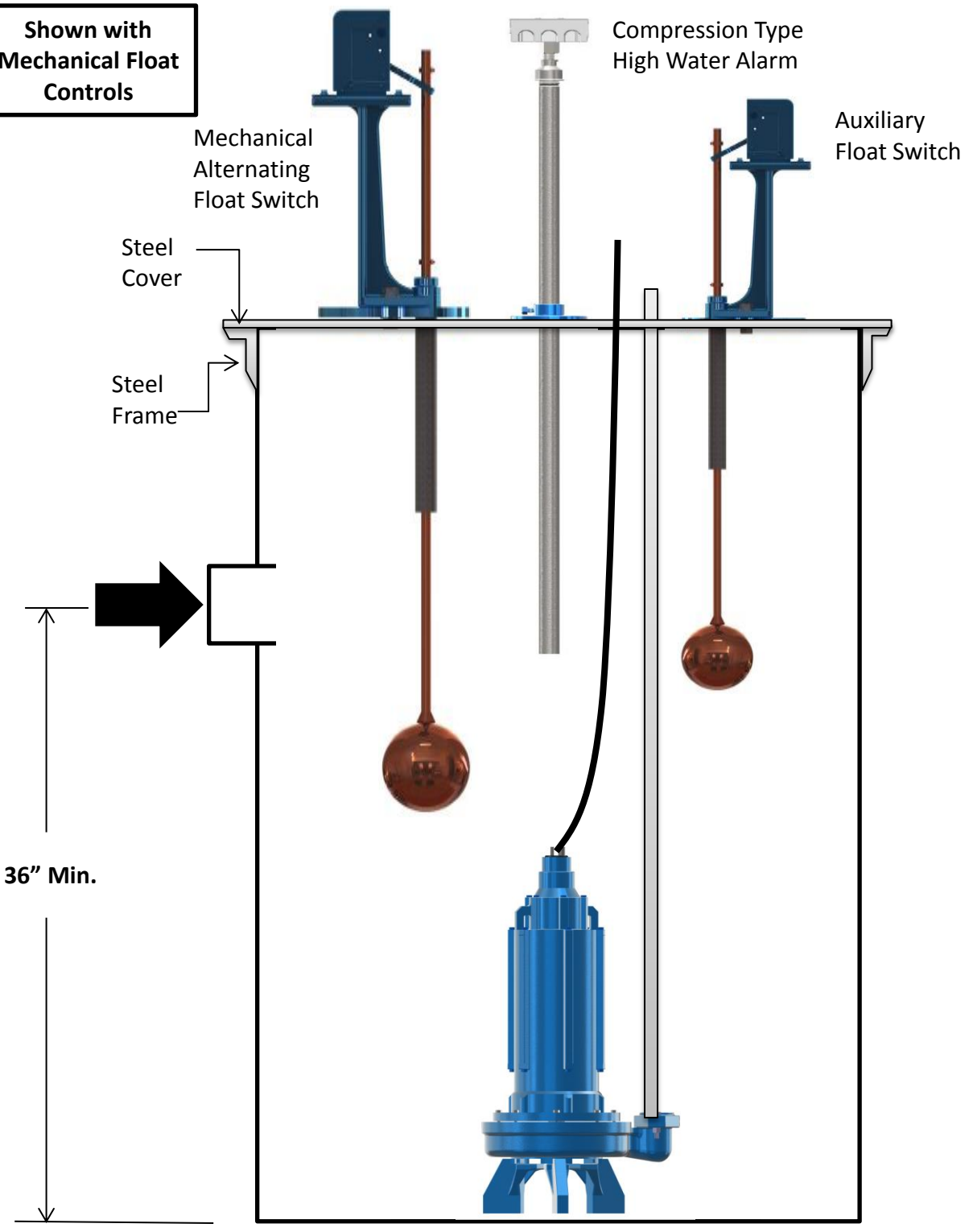
(1) Compression type High Water alarm , NEMA 1 Enclosure, will be installed through the basin cover 6” below the invert centerline to sense high water alarm condition. The contractor will provide a reliable 120V supply to the alarm horn.

(1) Federal Pump Model D-1200 Duplex Sump Pump control panel to be wall mounted by the contractor. Control panel will include: Individual fused disconnect switches, across-the-line type magnetic starters with overload protection, HOA selector switches, Pump run lights, 115V fused control circuit transformer, numbered wiring and terminal strip provided in NEMA 1 Enclosed and built to UL-508 standards.

Duplex Sump Pump system will be installed per manufacturers instructions and shall not be used during the construction process for water drainage that may include construction debris. Pump system is designed for typical sump drainage water and shall not be exposed to high temperature water applications or temporary dewatering use by the contractor during the construction period.

High Temperature Option : Provide quench system to include: air gap fitting installed in the duplex steel cover, 120 volt solenoid feed valve, pump mounted aquastat and integrated controls. Pump mounted sensor will measure and detect high water temperature and activate the solenoid feed valve for automatic on/off operation. Sensor shall be activated at 130 degree F and terminate operation at 100 degree F water. Provide Federal Pump VSS-25.D-HT pump/motor system designed to operate under these higher temperature conditions.

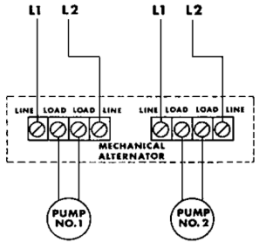
Shown with Mechanical Float Controls



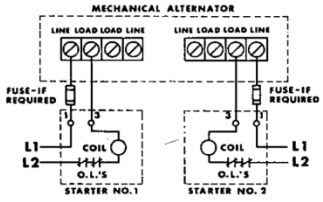
FEDERAL PUMP MODEL : FS-3-CLASS 9038AG-1
MECHANICAL ALTERNATING FLOAT SWITCH

*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

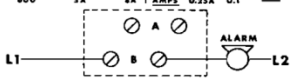


AC OPERATION OF MOTOR STARTERS

C65016-004-33

ELECTRICAL RATING OF ALARM SWITCH ONLY
CLASS 9007 TYPE AO1

AC PILOT DUTY			D.C. PILOT DUTY SINGLE THROW			
VOLTS	BREAK	MAKE	VOLTS	115	230	600
110	15A	40A	AMPS	0.5 A	0.25A	0.05A
230	10A	20A	DOUBLE THROW			
440	6A	10A	VOLTS	115	230	600
600	5A	8A	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

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)

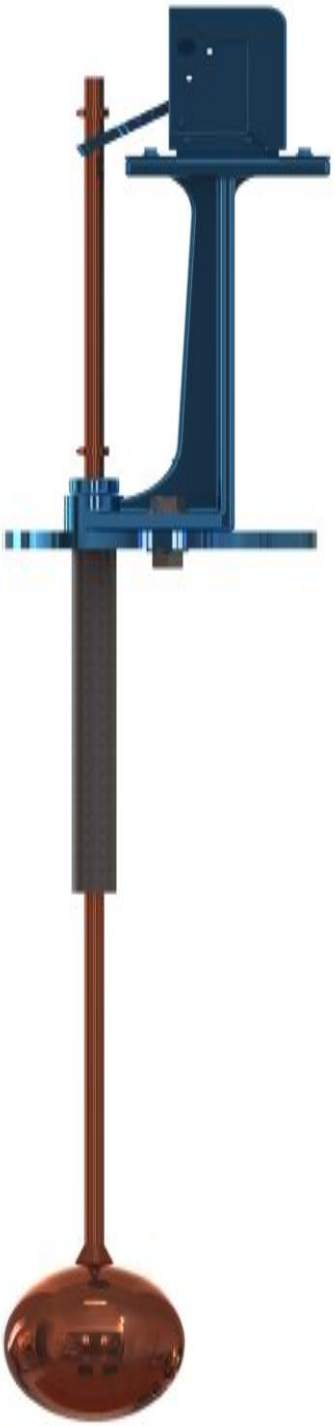


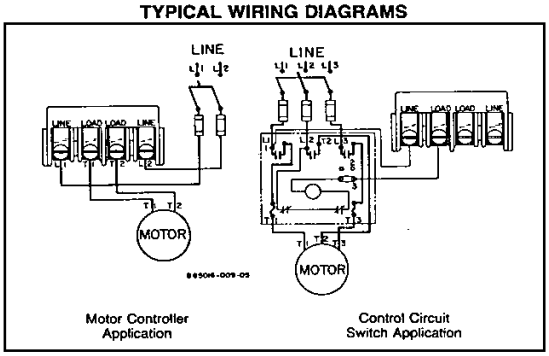
Table 1 Class 9035-9038 Electrical Ratings

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

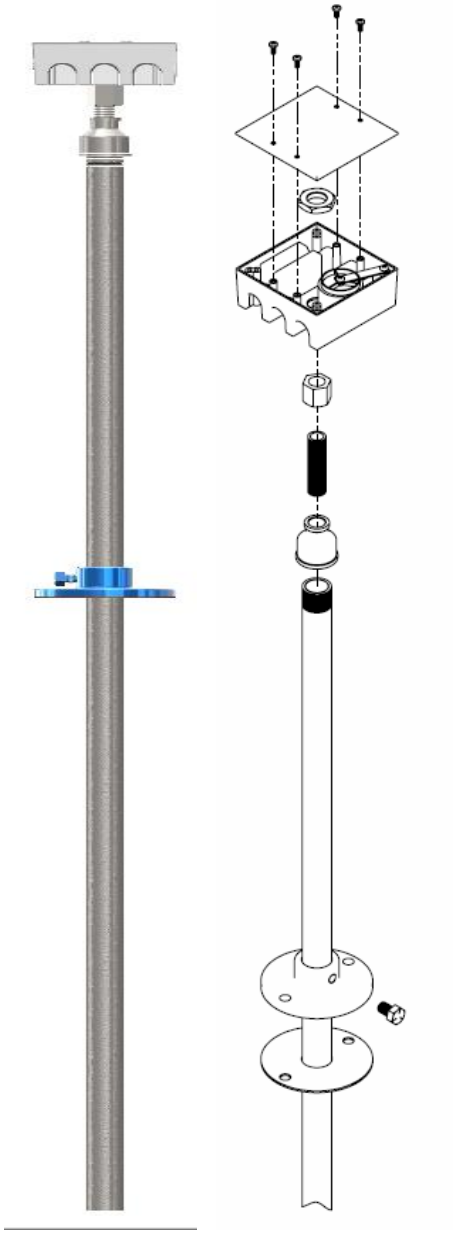
Voltage	Single Phase AC	Polyphase AC	DC
115	2 HP	3 HP	1 HP
230	3 HP	5 HP	1 HP
460-575	5 HP	5 HP	—
32	—	—	1/2 HP

☐ NEMA 1 ☐ NEMA 7

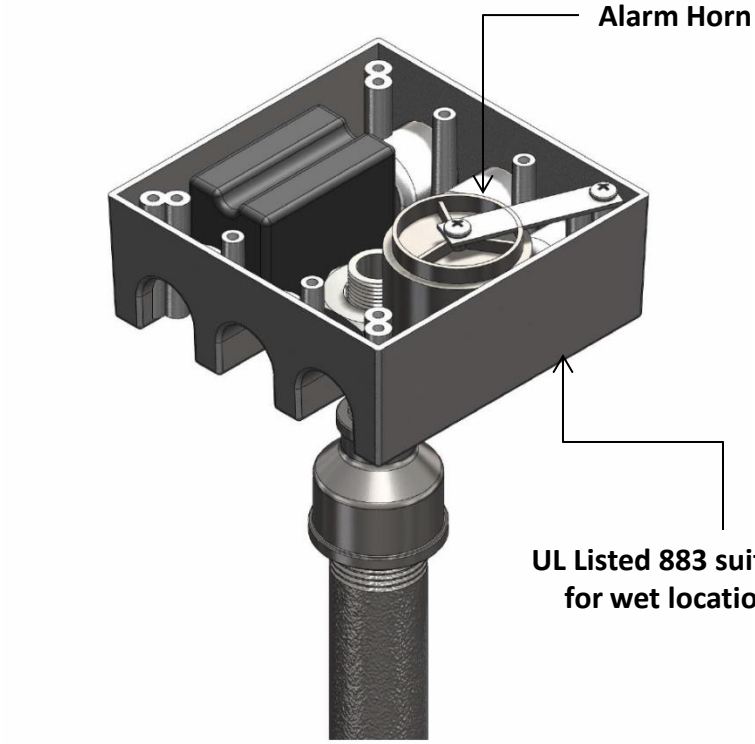
☐ NEMA 4

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

☐ NEMA 1 ☐ NEMA 4



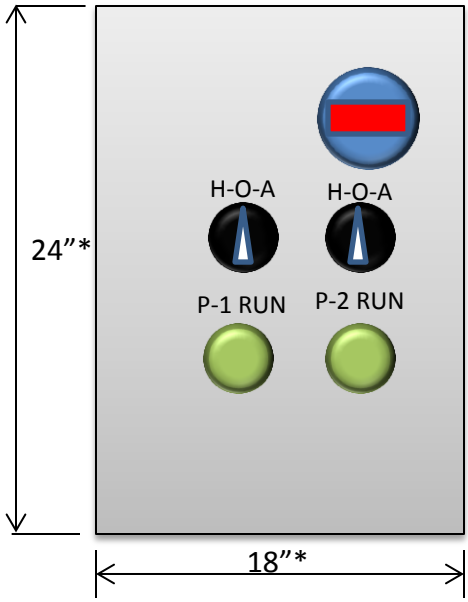
Provide separate 115V "reliable" connection to compression high water alarm assembly for proper connection.



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.

D-1200 Duplex Controls with Mechanical Alternating Float

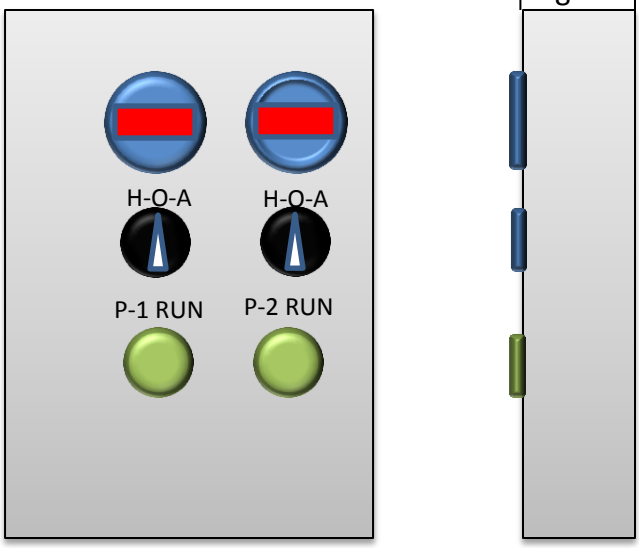
☐ Single Fused Disconnect



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.

Suggested Specifications: Submersible Float Bulb System

Furnish and install where shown in the plans and as may be detailed in the equipment schedule a Duplex Sump Pump system as manufacturered by Federal Pump Model 2.5 D VSS submersible sump pump. Each Duplex Sump Pump system shall be provided with the following components (shipped loose for field assembly)

(2) Submersible sump pumps of cast iron bronze fitted construction each provided with dual mechanical seals with a single outboard and single inboard seal for dual motor protection. Pumps shall be assembled and tested in Brooklyn, NY and provided with moisture sensing probes to sense the presence of water that may enter the lower seal chamber area. Moisture sensor probes will terminate pump operation and sound alarm. Each pump will be provided with 25 feet of submersible pump power cable with internal epoxy sealed leads and grommets preventing water intrusion into the submersible motors. Motors shall not exceed 1750 RPM.

(1) Duplex steel non-traffic bearing cover and frame assembly sized for the concrete pit as shown in the plans.

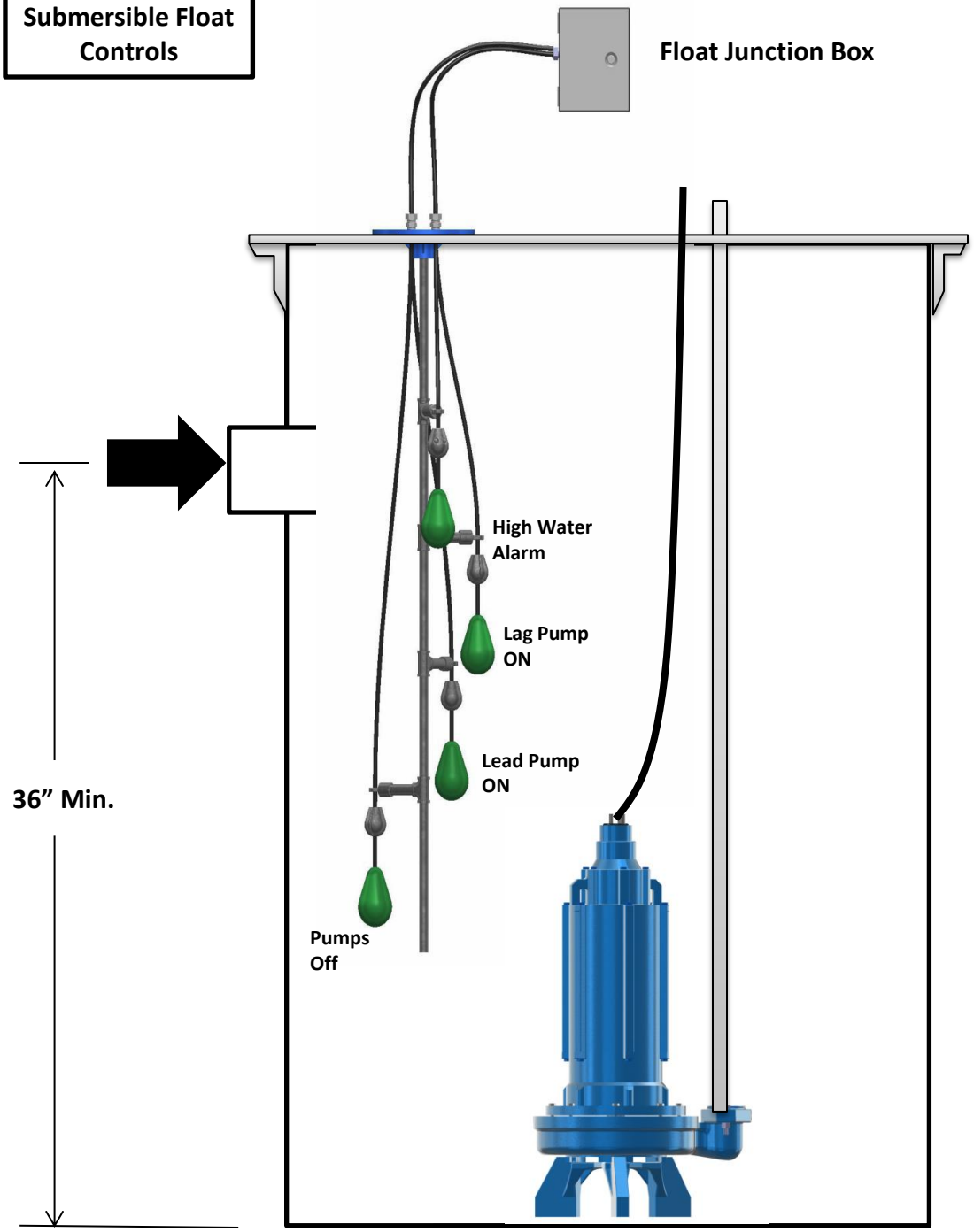
(1) Series SBS 4 bulb submersible float bulb system. The float bulbs shall be mounted to the SBS metal support system and suspended from the Duplex Steel Cover. Float bulbs shall be set according to the manufacture's requirements. Provide a NEMA 4 junction box mounted near the Sump pump systems for float bulb and electrical wire termination.

(1) Federal Pump Model SBS Duplex Sump Pump control panel to be wall mounted by the contractor. Control panel will include: Individual fused disconnect switches, across-the-line type magnetic starters with overload protection, HOA selector switches, PLC, Pump run lights, 24V fused control circuit transformer, high water alarm light and alarm horn with silence pushbutton, numbered wiring and terminal strip provided in NEMA 1 enclosure and built to UL-508 standards.

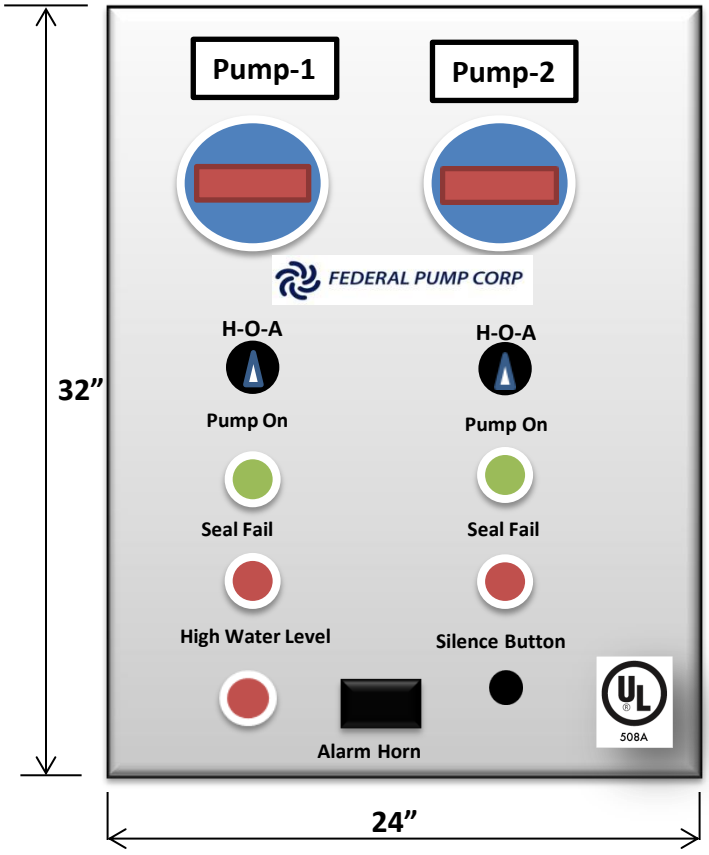
Duplex Sump Pump system will be installed per manufacturers instructions and shall not be used during the construction process for water drainage that may include construction debris. Pump system is designed for typical sump drainage water and shall not be exposed to high temperature water applications or temporary dewatering use by the contractor during the construction period.

High Temperature Option : Provide quench system to include: air gap fitting installed in the duplex steel cover, 120 volt solenoid feed valve, pump mounted aquastat and integrated controls. Pump mounted sensor will measure and detect high water temperature and activate the solenoid feed valve for automatic on/off operation. Sensor shall be activated at 130 degree F and terminate operation at 100 degree F water. Provide Federal Pump VSS-25.D-HT pump/motor system designed to operate under these higher temperature conditions.

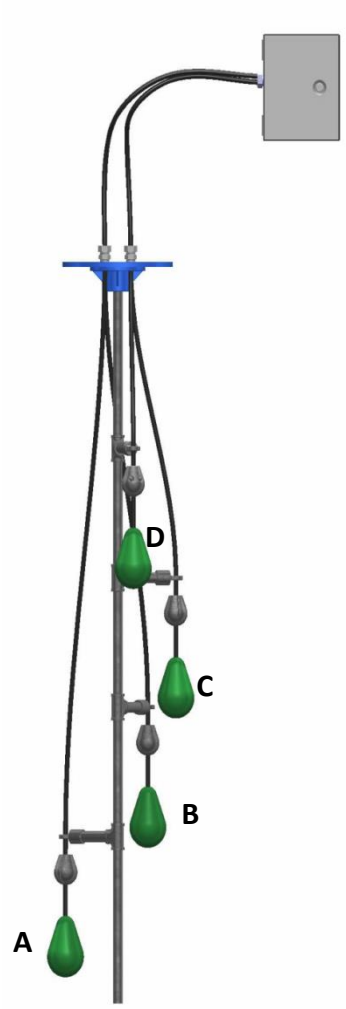
Shown with Submersible Float Controls



Type SBS submers-a-bulb controller



Above control panel is sample only and will vary based upon options, enclosure style or other specifications.

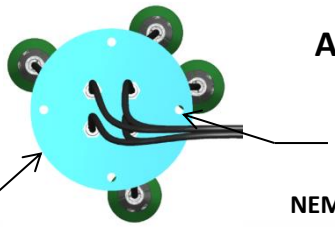


Available in NEMA 1,12,4,4X or other enclosure styles as may be required for the installation. Simplex (single pump), Duplex (2 pump), Triplex (3 pump) control systems available.

Control Panel shown include several options and should be reviewed in detail prior to order. Dimensions may vary based upon enclosure type, options requested and specification requirements.

SBS Float Control system includes: Floats and support frame, mounting bracket, float wire compression fittings, NEMA 4 junction box, simplex, duplex or triplex control panel (for wall mounting) and provided in enclosure specified (or ordered)

SBS Liquid Level Float Control
Above Ground Float Control System



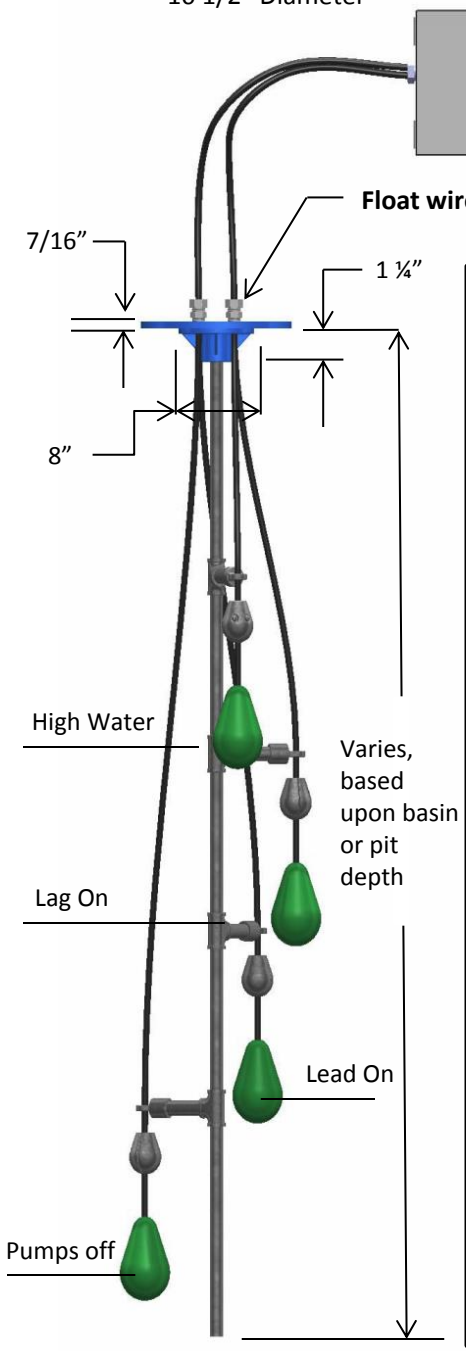
(4) 1/2" Holes on 9" Bolt Circle
(**Note: 8" Cover Plate Opening**)

10 1/2" Diameter

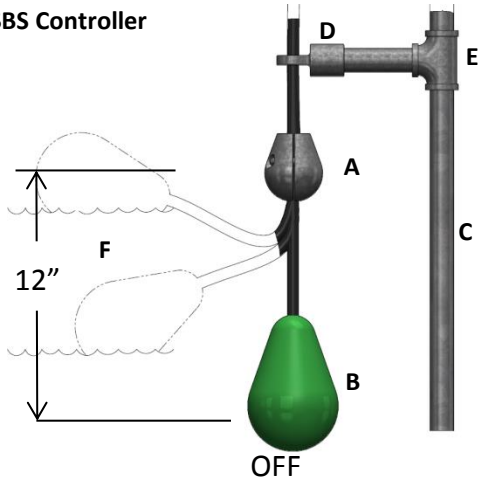
NEMA 4 Power Junction Box

Connect to Wall Mounted Duplex/Triplex SBS Controller

Float wire compression fittings



Float Support Detail



Notes:

1. Allow 8" diameter opening in cover for in installation of SBS float system.
2. Ensure gasket is installed between SBS plate and basin cover.
3. Submersible motor power cables will exit pit or basin cover from another point (refer to cover details for those locations).
4. NEMA 4 junction box shown is for float switches and power cable connections. Where possible, wire those float and pump power cables directly to the level control panel and not the junction box.
5. SBS eye hook (D) and elbow connections (E) preset at the factory. Coordinate those with basin depth.
6. Contractor to set SBS system in place, draw float wires through eye hooks and through compression fittings and then wire to junction box or directly to control panel (refer to attached drawings for control panel).

Item	Description
A	Metal weight maintains float position
B	Plastic mechanical float switch –floats on water surface
C	¾" galvanized steel threaded rod assembly
D	Threaded eye hook- holds float wire in place
E	¾" threaded "T"-part of SBS float assembly
F	Allow 12" level for on/off operation