FEDERAL PUMP CORP
1144 Utica Ave, Brooklyn, NY 11203

Series VSPV-Simplex Booster System

Federal Pump VSPV Simplex variable speed booster system combines over 87 years of Federal Pump product reliability with new designs that reduce energy costs, extend product life and provide innovative solutions where water pressure challenges exist.

Meets SDWA and NSF standards for potable water use.

- Mechanical equipment
- Roof tank fill systems
- Booster systems
- Irrigation systems
- Chemical feed systems
- Marine vessels
- Apartment/Condo Use
- Cooling tower
- High Rise
- Hospital
- Universities
- Hotel/Casino Water-TI
- Water fountain display

Capacities to 200GPM
Pressure Boost to 200PSI*
Sizes 1 to 3”
HP to 50
Available in single and three phase power

*Higher pressure available-Consult local sales office

- Low Installed Costs
- Built-In-Reliability
- Energy Saver
- Quiet Operation
- Certified and Tested
- Backed by Federal Pump 87 year tradition
- Supported by USA Distribution Network
- Automatic Operation 24/7
- Three year extended warranty**

** Refer to Federal Pump limited warranty

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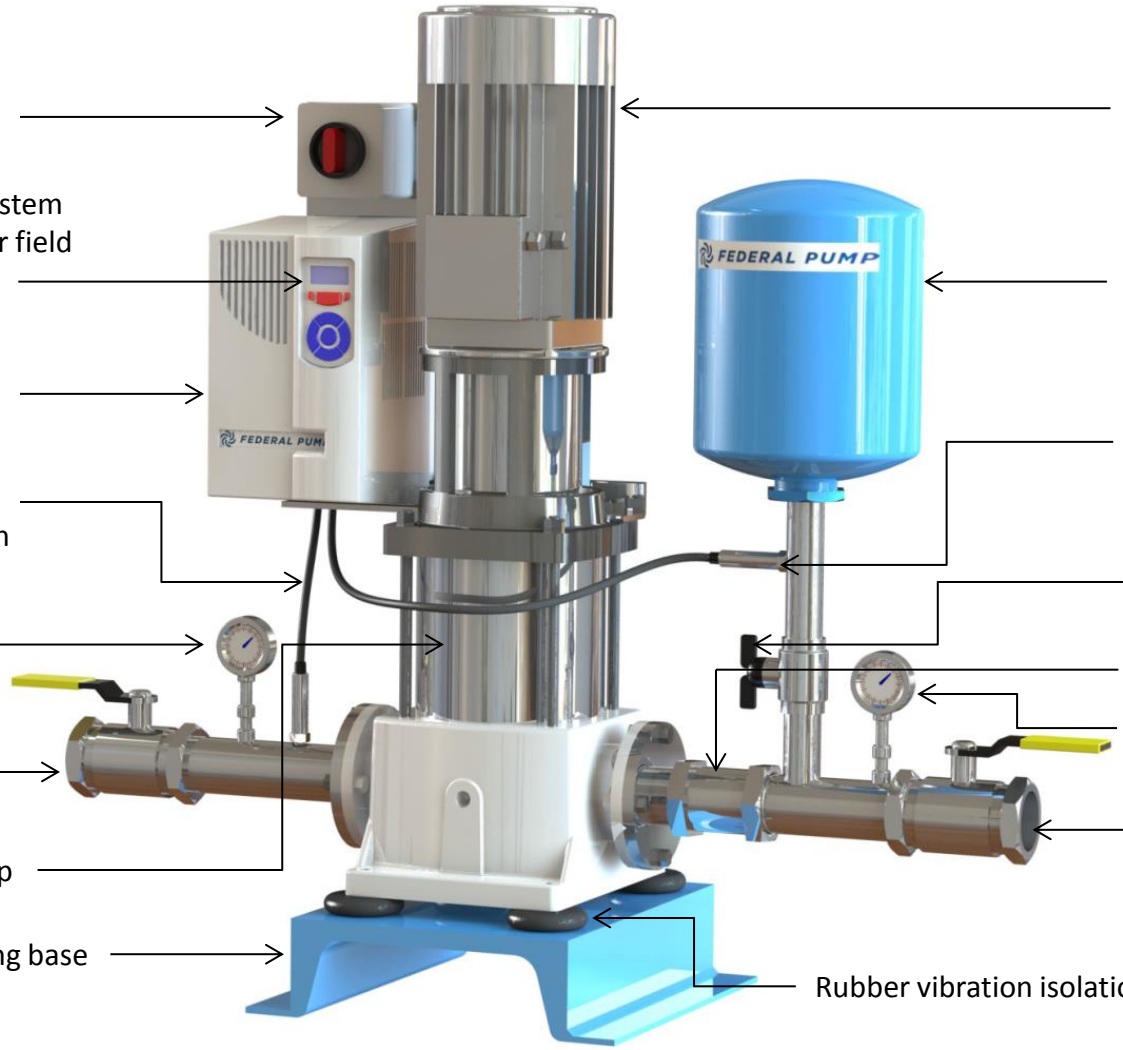

Power disconnect switch

Digital display of pump system performance. Provides for field adjustable set points.

Energy efficient variable speed controls reduces energy consumption

4-20mA pressure transducer for low suction cut-off.

Suction pressure gauge

Suction isolation valve

Stainless steel fitted pump

Steel mounting base

TEFC or ODP Motor enclosure available in standard or premium efficient design.

Discharge pressure vessel for “cushioned” pressure sensing.

4-20mA pressure transducer for pump operation

Tank isolation valve

System check valve

Discharge pressure gauge

Discharge isolation valve

Rubber vibration isolation pads

Saves energy buy increasing and reducing pump performance based upon actual demand!

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Standard construction includes all stainless steel components ensuring quality components with long lasting corrosion resistant life.

Item	Material-STD	Material-Optional
Pump Suction Case	Stainless Steel	Cast Iron
Impeller	Stainless Steel	Stainless Steel
Shaft	Stainless Steel	Stainless Steel
Outer Casing	Stainless Steel	Stainless Steel
Suction Valve	Stainless Steel	Stainless Steel
Suction Piping	Stainless Steel	Stainless Steel
Discharge Isolation valve	Stainless Steel	Cast Iron
Discharge Check valve	Stainless Steel	Cast Iron
Discharge piping	Stainless Steel	Copper-0% Lead
Transducers	Stainless Steel	Copper-0% lead
Tank Isolation valve	Stainless Steel	Cast Iron
Cushion Tank Liner	Neoprene	Neoprene
Base Plate	Channel Steel	Channel Steel

FEDERAL PUMP CORP

Series VSPV-Simplex Booster System

Selection Table

Model No: VSPV-10040-2

- 2=3600RPM
- Pressure: PSI
- Flow: GPM

Select the model number based upon system flow and pressure requirements from the table below!

Refer to attached suggested specifications for system operation

PSI	TDH	Model No	Pump Flow Rate required								
			20 GPM	40 GPM	60 GPM	80 GPM	100 GPM	125 GPM	150 GPM	175 GPM	200 GPM
20	46	VSPV-	2020-2 0.75HP	4020-2 0.75 HP	6020-2 2 HP	8020-1 3 HP	10020-2 3 HP	12520-2 5 HP	15020-2 5 HP	17520-2 7.5 HP	20020-2 7.5 HP
40	92	VSPV-	2040-2 1.5 HP	4040-2 1.5 HP	6040-2 5 HP	8040-2 5 HP	10040-2 5 HP	12540-2 7.5 HP	15040-2 7.5 HP	17540-2 7.5 HP	20040-2 7.5 HP
60	139	VSPV-	2060-2 1.5 HP	4060-2 3 HP	6060-2 5 HP	8060-2 5 HP	10060-2 7.5 HP	12560-2 7.5 HP	15060-2 7.5 HP	17560-2 15 HP	20060-2 15 HP
80	185	VSPV-	2080-2 3 HP	4080-2 3 HP	6080-2 7.5 HP	8080-2 7.5 HP	10080-2 7.5 HP	12580-2 10 HP	15080-2 10 HP	17580-2 15 HP	20080-2 15 HP
100	231	VSPV-	20100-2 3 HP	40100-2 5 HP	60100-2 7.5 HP	80100-2 10 HP	100100-2 10 HP	125100-2 15 HP	150100-2 15 HP	175100-2 20 HP	200100-2 20 HP
120	277	VSPV-	20120-2 5 HP	40120-2 5 HP	60120-2 10 HP	80120-2 15 HP	100120-2 15 HP	125120-2 15 HP	150120-2 20 HP	175120-2 20 HP	200120-2 20 HP
140	323	VSPV-	20140-2 5 HP	40140-2 7.5 HP	60140-2 15 HP	80140-2 15 HP	100140-2 15 HP	125140-2 20 HP	150140-2 20 HP	175140-2 25 HP	200140-2 25 HP
160	370	VSPV-	20160-2 5 HP	40160-2 7.5 HP	60160-2 15 HP	80160-2 15 HP	100160-2 20 HP	125160-2 20 HP	150160-2 25 HP	175160-2 30 HP	200160-2 30 HP
180	416	VSPV-	20180-2 5 HP	40180-2 7.5 HP	60180-2 15 HP	80180-2 20 HP	100180-2 20 HP	125180-2 25 HP	150180-2 25 HP	175180-2 30 HP	200180-2 30 HP
200	462	VSPV-	20200-2 5 HP	40200-2 10 HP	60200-2 15 HP	80200-2 20 HP	100200-2 20 HP	125200-2 25 HP	150200-2 30 HP	175200-2 50 HP	200200-2 50 HP

FEDERAL PUMP CORP

Series VSPV-Simplex Booster System

Suggested Specifications

General Product Overview

Furnish and install where shown in the plans a Federal Pump Series VSPV Simplex Variable Speed prefabricated system designed to deliver the scheduled flow and pressure differential as shown in the plans. System will require a single power connection, single suction and single discharge piping connection. All other wiring and piping internal to the prefabricated system will be provided by the pump manufacturer. Complete system shall be a product manufacturered in the City of New York by a licensed and registered USA pump manufacturer. Pump system shall be warranted for a period of 3 years from the date of shipment.

Sequence of Operation:

The system discharge pressure transducer will monitor the discharge pressure of the system to ensure system pressure requirements are maintained. In the event of a drop in system pressure the pressure transducer will signal the variable speed drive to initiate operation and increase motor speed thereby increasing pressure output from the pump. The pump will continue increasing speed until such time that system pressure conditions are met. The pump will increase or decrease speed as required by system demand. When system demand is satisfied, the variable speed controller will, after a time delay, terminate pump operation. The controller will include system set point adjustments that allow the pressure settings and time delay settings to be adjusted as may be required by the system. The controller will include digital display of those set points.

Low Suction Cut-Off: In the event of low suction condition, the suction pressure transducer will sense the decline in pressure below the acceptable low suction pressure point and terminate operation of the pump and display a red light alarm light condition. The digital display board will also communicate the alarm condition and failure reason.

Start-Up: Upon completion of installation by the installing contractor, the pump manufacturer's representative will review the Installation to ensure proper connections, operate a start-up and witness the performance of the VSPV System from 0 to 100% system pressure, monitor and test low suction pressure cut-off and document completion of the commissioned system.

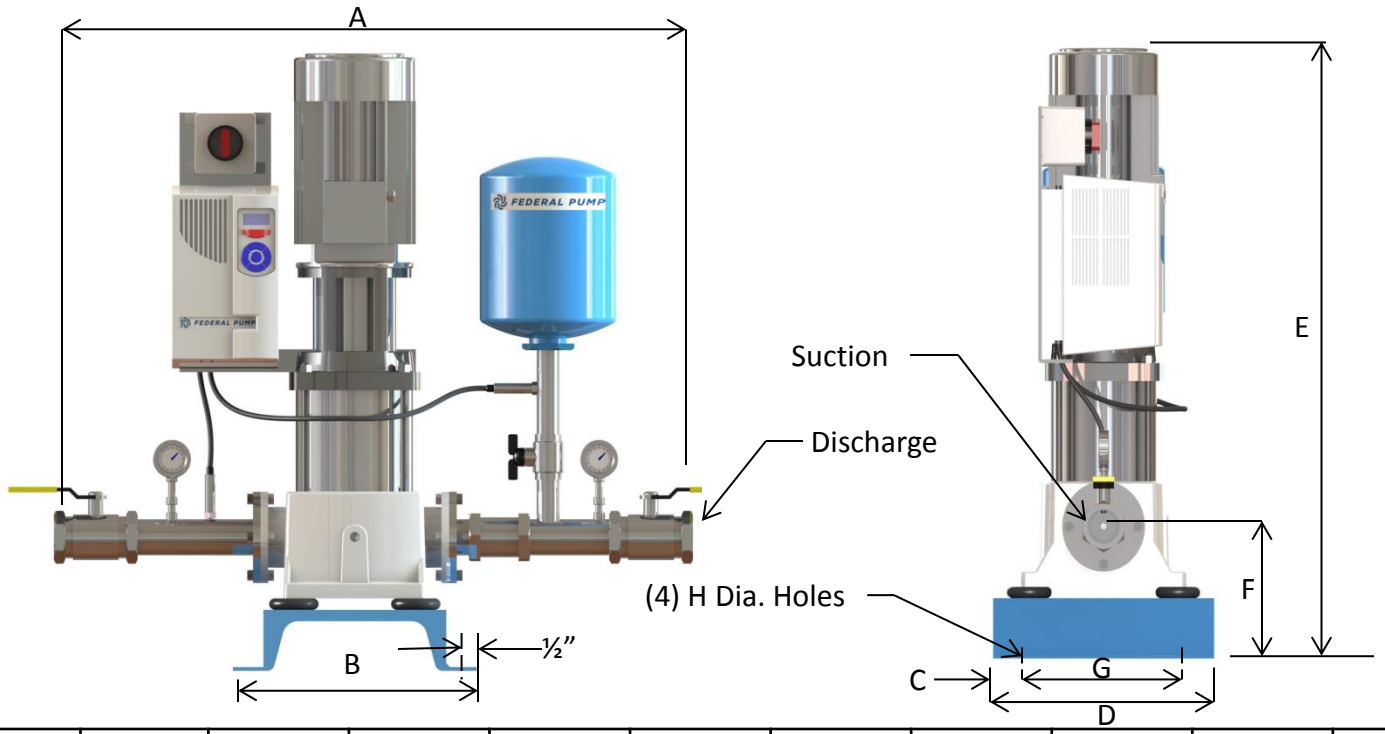
If the system is provided with a charged cushion tank, the pump manufacturers representative will ensure the tank is charged to the appropriate pre-charge condition to ensure proper operation of the system.

Operation manuals: A complete set of system operation manuals will be provided to the customer upon completion of system start-up.

Maintenance Agreement: The pump manufacturer's representative will provide an 18 month maintenance agreement where the representative will review the installation every 6 months to ensure proper operation of the system and suggest any necessary adjustments due to actual system performance over the period. A separate agreement will be submitted to the customer and included in the base price of the equipment purchase.

FEDERAL PUMP CORP

Series VSPV-Simplex Booster System



Dimensional Data
2020-20200 Systems

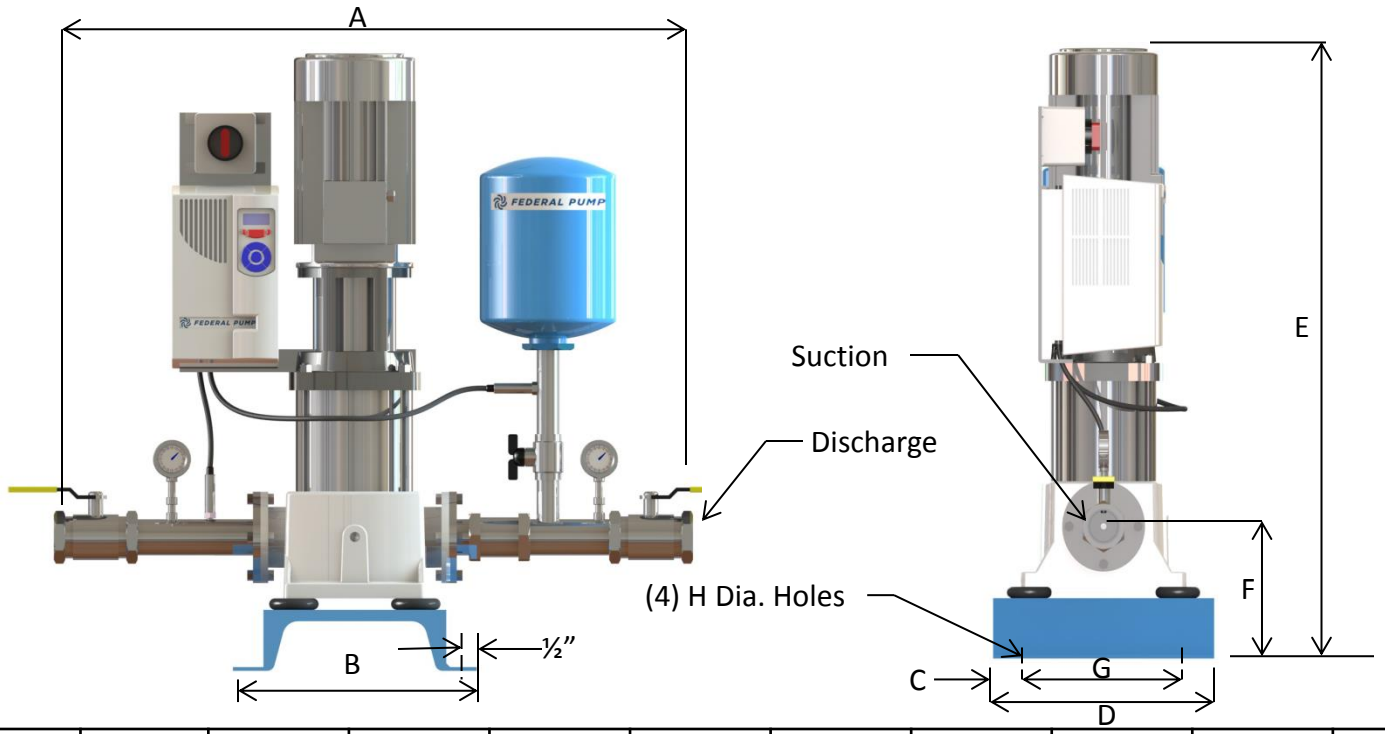
20 GPM

Dimensions subject to change without notice!

Model Numbers	Suction	Discharge	A	B	C	D	E	F	G	H	Weight (lbs.)
2020	1.25	1.25	24	10	1	10	22	5	8	5/8	240
2040	1.25	1.25	24	10	1	10	25	5	8	5/8	245
2060	1.25	1.25	24	10	1	10	34	5	8	5/8	245
2080	1.25	1.25	24	10	1	10	35	5	8	5/8	255
20100	1.25	1.25	24	10	1	10	37	5	8	5/8	260
20120	1.25	1.25	24	10	1	10	40	5	8	5/8	290
20140	1.25	1.25	24	10	1	10	40	5	8	5/8	295
20160	1.25	1.25	24	10	1	10	42	5	8	5/8	300
20180	1.25	1.25	24	10	1	10	44	5	8	5/8	310
20200	1.25	1.25	24	10	1	10	46	5	8	5/8	315

FEDERAL PUMP CORP

Series VSPV-Simplex Booster System



Dimensional Data
4020-40200 Systems

40 GPM

Dimensions subject to change without notice!

Model Numbers	Suction	Discharge	A	B	C	D	E	F	G	H	Weight (lbs.)
4020	2	2	28	10	1	10	25	5.5	8	5/8	200
4040	2	2	28	10	1	10	26	5.5	8	5/8	245
4060	2	2	28	10	1	10	34	5.5	8	5/8	255
4080	2	2	28	10	1	10	35	5.5	8	5/8	290
40100	2	2	28	10	1	10	37	5.5	8	5/8	290
40120	2	2	28	10	1	10	40	5.5	8	5/8	320
40140	2	2	28	10	1	10	40	5.5	8	5/8	370
40160	2	2	28	10	1	10	42	5.5	8	5/8	380
40180	2	2	28	10	1	10	44	5.5	8	5/8	390
40200	2	2	28	10	1	10	46	5.5	8	5/8	400

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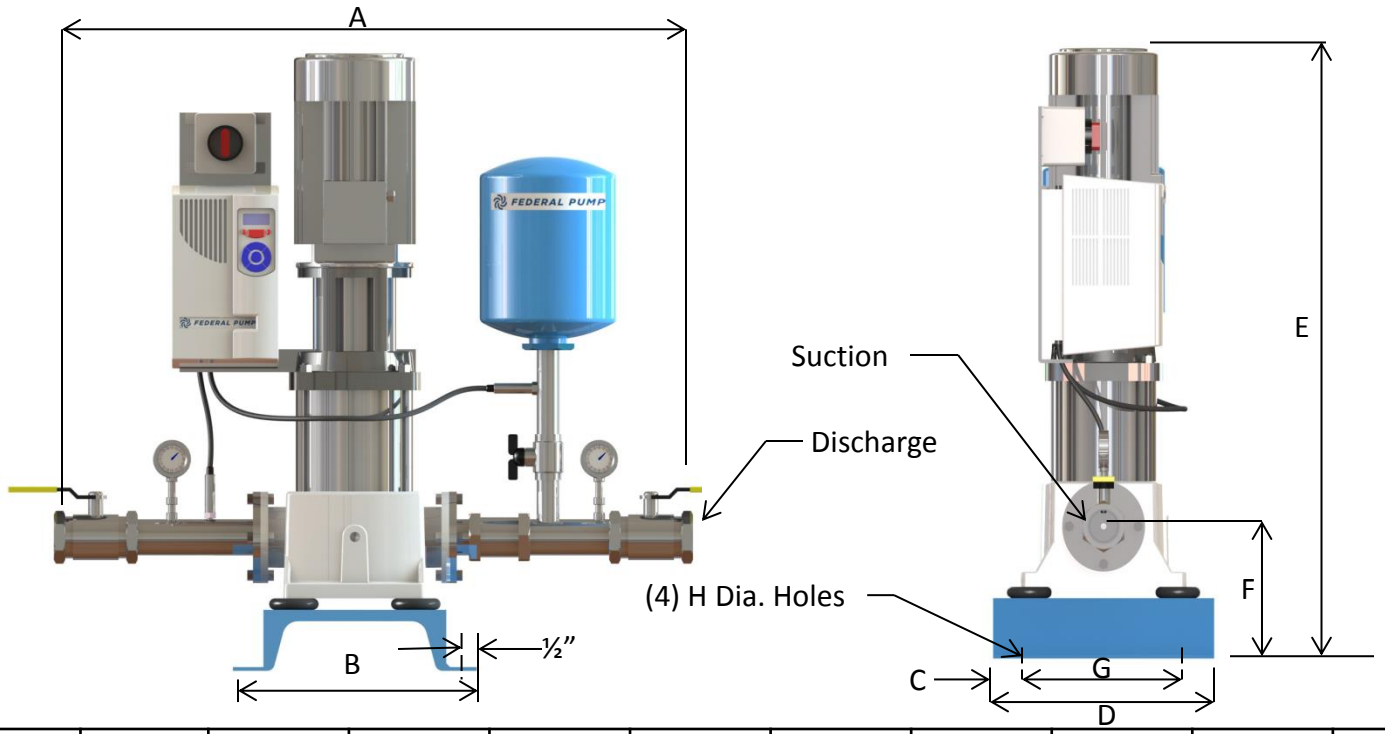
Series VSPV-Simplex Booster System



Dimensional Data
6020-60200 Systems

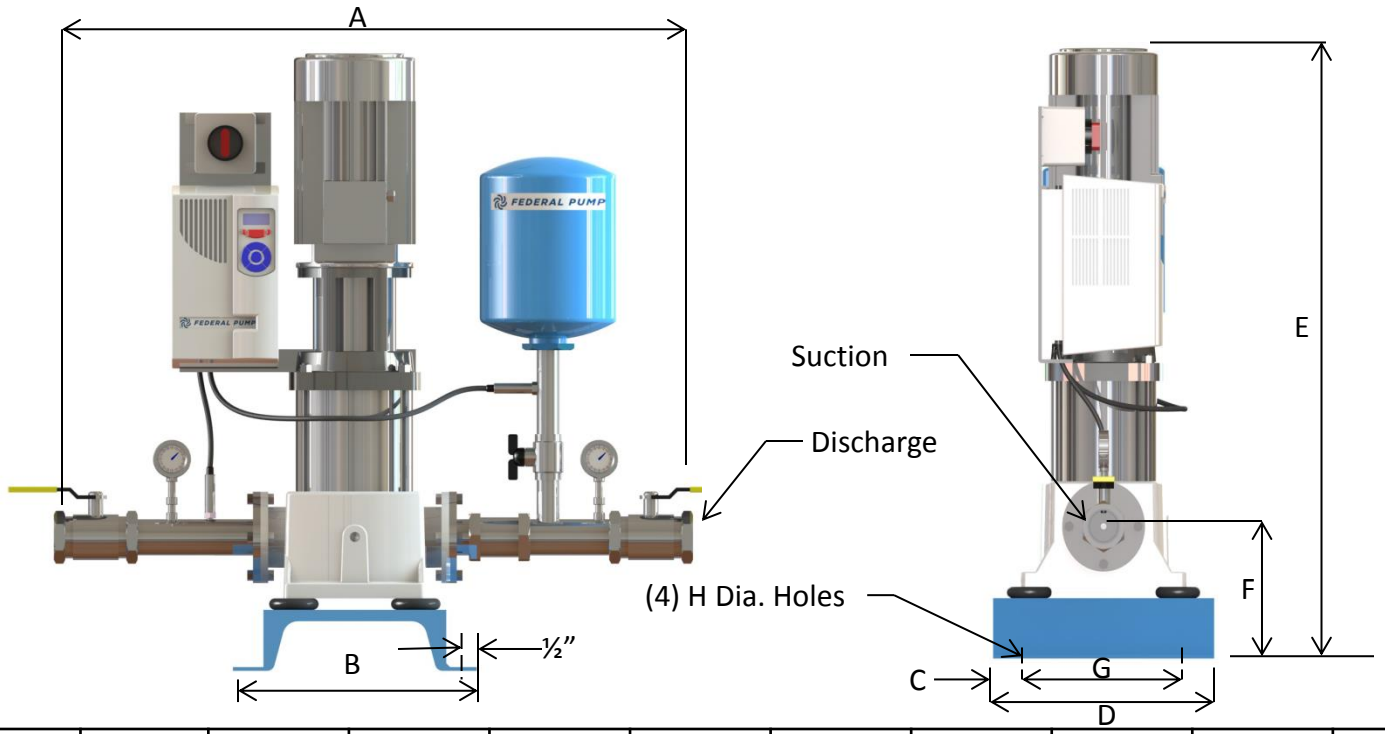
60 GPM

Dimensions subject to change without notice!

Model Numbers	Suction	Discharge	A	B	C	D	E	F	G	H	Weight (lbs.)
6020	2	2	28	12	1	12	35	5.5	10	5/8	280
6040	2	2	28	12	1	12	35	5.5	10	5/8	410
6060	2	2	28	12	1	12	35	5.5	10	5/8	415
6080	2	2	28	12	1	12	39	5.5	10	5/8	500
60100	2	2	28	12	1	12	39	5.5	10	5/8	510
60120	2	2	28	12	1	12	41	5.5	10	5/8	515
60140	2	2	28	12	1	12	48	5.5	10	5/8	520
60160	2	2	28	12	1	12	49	5.5	10	5/8	525
60180	2	2	28	12	1	12	50	5.5	10	5/8	528
60200	2	2	28	12	1	12	50	5.5	10	5/8	532

FEDERAL PUMP CORP

Series VSPV-Simplex Booster System



Dimensional Data
8020-80200 Systems

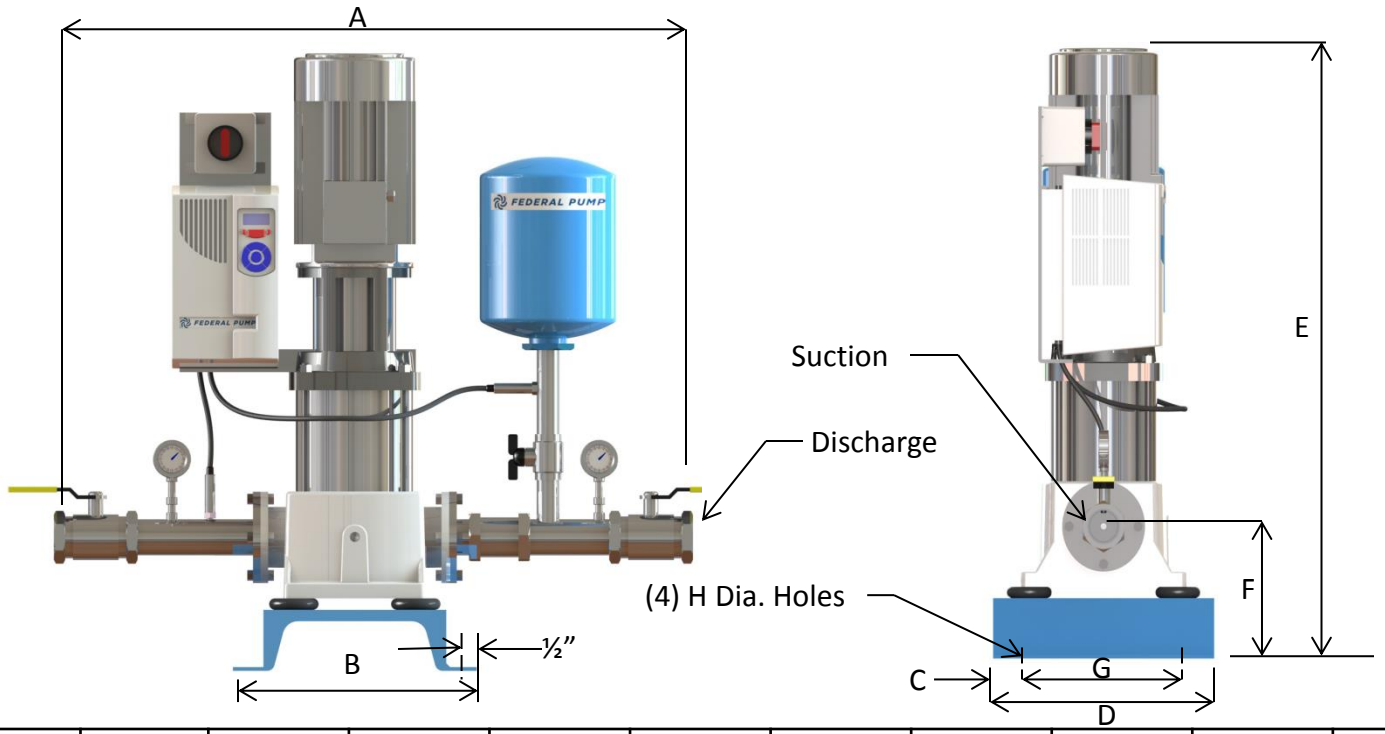
80 GPM

Dimensions subject to change without notice!

Model Numbers	Suction	Discharge	A	B	C	D	E	F	G	H	Weight (lbs.)
8020	2	2	28	12	1	12	33	5.5	10	5/8	350
8040	2	2	28	12	1	12	35	5.5	10	5/8	500
8060	2	2	28	12	1	12	35	5.5	10	5/8	500
8080	2	2	28	12	1	12	37	5.5	10	5/8	575
80100	2	2	28	12	1	12	39	5.5	10	5/8	650
80120	2	2	28	12	1	12	44	5.5	10	5/8	675
80140	2	2	28	12	1	12	45	5.5	10	5/8	675
80160	2	2	28	12	1	12	45	5.5	10	5/8	675
80180	2	2	28	12	1	12	48	5.5	10	5/8	690
80200	2	2	28	12	1	12	50	5.5	10	5/8	690

FEDERAL PUMP CORP

Series VSPV-Simplex Booster System



Dimensional Data
10020-100200 Systems

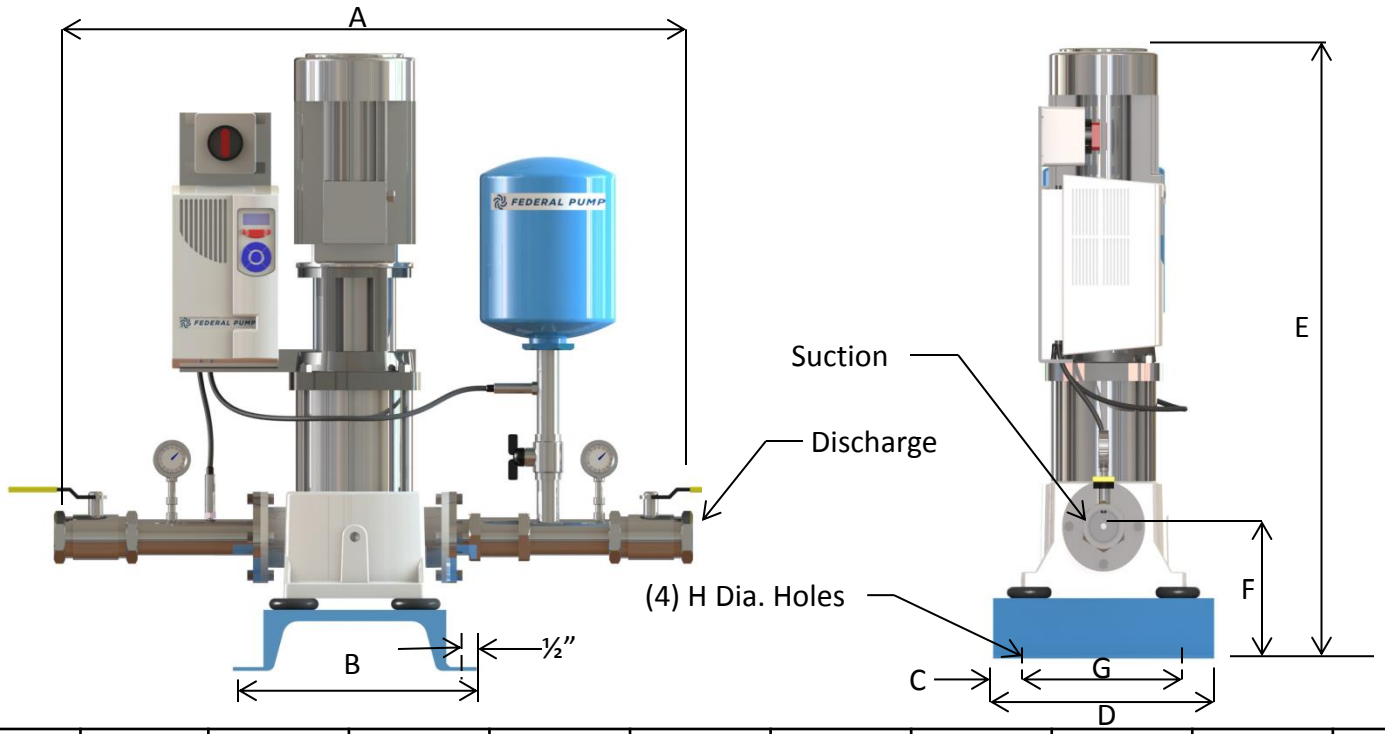
100 GPM

Dimensions subject to change without notice!

Model Numbers	Suction	Discharge	A	B	C	D	E	F	G	H	Weight (lbs.)
10020	2.5	2.5	30	12	1	12	39	6 1/8	10	5/8	350
10040	2.5	2.5	30	12	1	12	42	6 1/8	10	5/8	500
10060	2.5	2.5	30	12	1	12	42	6 1/8	10	5/8	500
10080	2.5	2.5	30	12	1	12	42	6 1/8	10	5/8	575
100100	2.5	2.5	30	12	1	12	42	6 1/8	10	5/8	650
100120	2.5	2.5	30	12	1	12	54	6 1/8	10	5/8	675
100140	2.5	2.5	30	12	1	12	54	6 1/8	10	5/8	675
100160	2.5	2.5	30	12	1	12	57	6 1/8	10	5/8	675
100180	2.5	2.5	30	12	1	12	57	6 1/8	10	5/8	690
100200	2.5	2.5	30	12	1	12	62	6 1/8	10	5/8	690

FEDERAL PUMP CORP

Series VSPV-Simplex Booster System



Dimensional Data
12520-125200 Systems

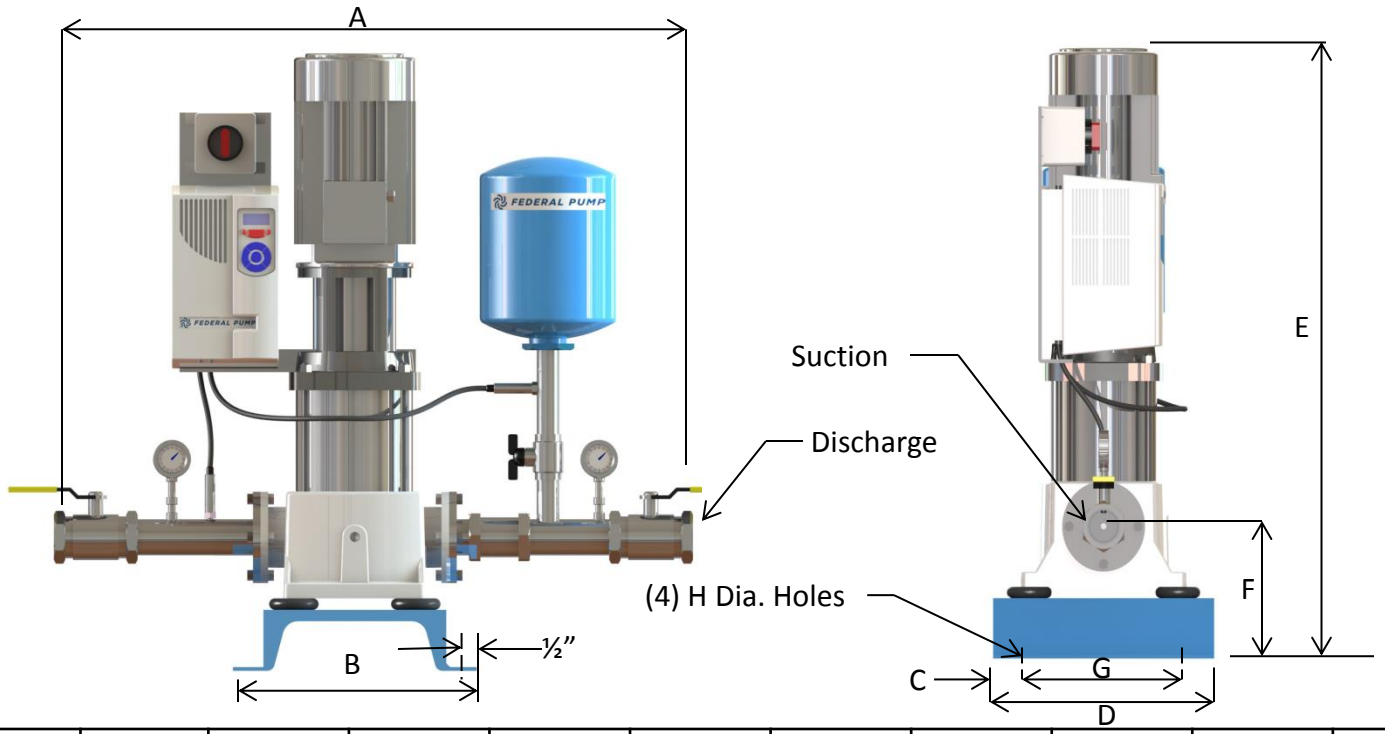
125 GPM

Dimensions subject to change without notice!

Model Numbers	Suction	Discharge	A	B	C	D	E	F	G	H	Weight (lbs.)
12520	2.5	2.5	30	14	1	14	39	6 1/8	12	5/8	350
12540	2.5	2.5	30	14	1	14	42	6 1/8	12	5/8	500
12560	2.5	2.5	30	14	1	14	42	6 1/8	12	5/8	500
12580	2.5	2.5	30	14	1	14	42	6 1/8	12	5/8	575
125100	2.5	2.5	30	14	1	14	48	6 1/8	12	5/8	650
125120	2.5	2.5	30	14	1	14	52	6 1/8	12	5/8	675
125140	2.5	2.5	30	14	1	14	55	6 1/8	12	5/8	675
125160	2.5	2.5	30	14	1	14	55	6 1/8	12	5/8	675
125180	2.5	2.5	30	14	1	14	60	6 1/8	12	5/8	690
125200	2.5	2.5	30	14	1	14	60	6 1/8	12	5/8	690

FEDERAL PUMP CORP

Series VSPV-Simplex Booster System



Dimensional Data
15020-150200 Systems

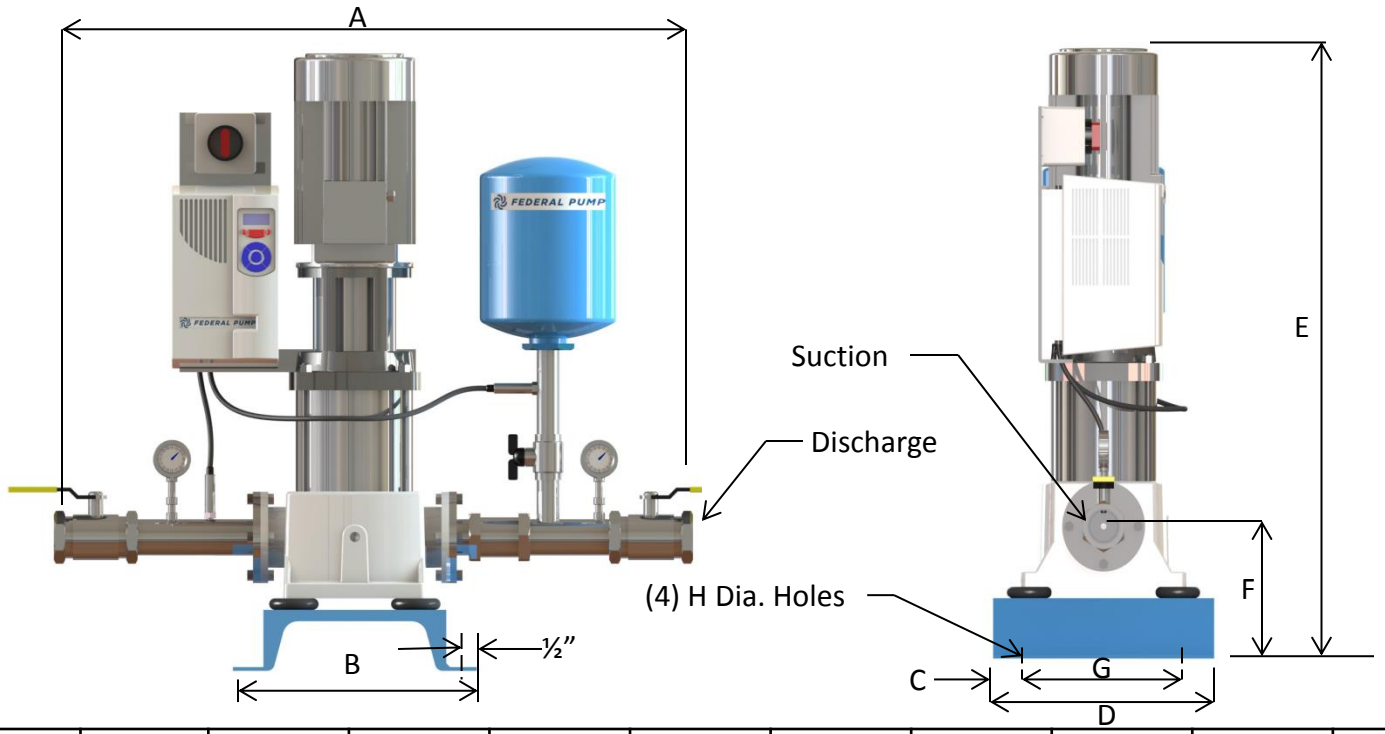
150 GPM

Dimensions subject to change without notice!

Model Numbers	Suction	Discharge	A	B	C	D	E	F	G	H	Weight (lbs.)
15020	2.5	2.5	30	14	1	14	39	6 1/8	12	5/8	350
15040	2.5	2.5	30	14	1	14	42	6 1/8	12	5/8	500
15060	2.5	2.5	30	14	1	14	42	6 1/8	12	5/8	500
15080	2.5	2.5	30	14	1	14	42	6 1/8	12	5/8	575
150100	2.5	2.5	30	14	1	14	48	6 1/8	12	5/8	650
150120	2.5	2.5	30	14	1	14	52	6 1/8	12	5/8	675
150140	2.5	2.5	30	14	1	14	55	6 1/8	12	5/8	675
150160	2.5	2.5	30	14	1	14	55	6 1/8	12	5/8	675
150180	2.5	2.5	30	14	1	14	60	6 1/8	12	5/8	690
150200	2.5	2.5	30	14	1	14	60	6 1/8	12	5/8	690

FEDERAL PUMP CORP

Series VSPV-Simplex Booster System



Dimensional Data
17520-175200 Systems

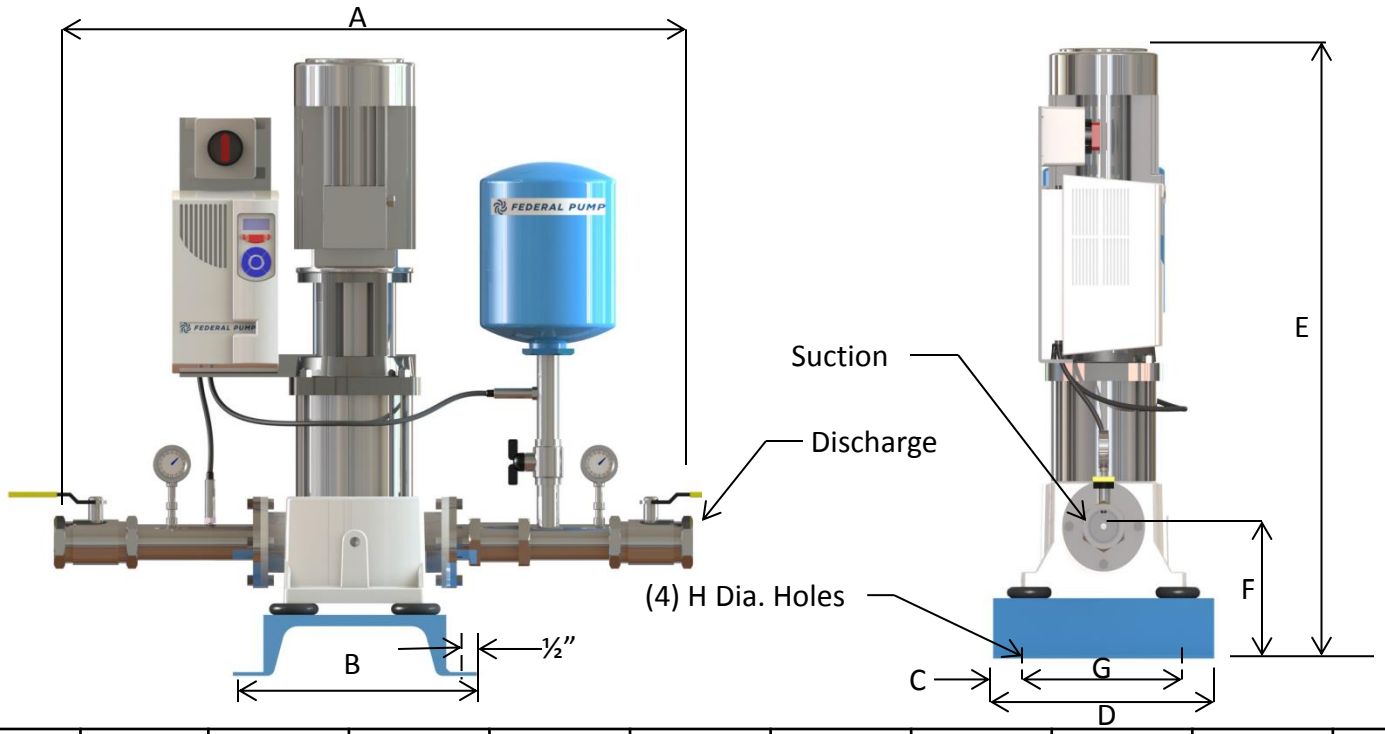
175 GPM

Dimensions subject to change without notice!

Model Numbers	Suction	Discharge	A	B	C	D	E	F	G	H	Weight (lbs.)
17520	3	3	40	16	1	16	42	7.5	14	5/8	350
17540	3	3	40	16	1	16	42	7.5	14	5/8	500
17560	3	3	40	16	1	16	50	7.5	14	5/8	500
17580	3	3	40	16	1	16	50	7.5	14	5/8	575
175100	3	3	40	16	1	16	53	7.5	14	5/8	650
175120	3	3	40	16	1	16	53	7.5	14	5/8	675
175140	3	3	40	16	1	16	57	7.5	14	5/8	675
175160	3	3	40	16	1	16	63	7.5	14	5/8	675
175180	3	3	40	16	1	16	63	7.5	14	5/8	690
175200	3	3	40	16	1	16	66	7.5	14	5/8	690

FEDERAL PUMP CORP

Series VSPV-Simplex Booster System



Dimensional Data
20020-200200 Systems

200 GPM

Dimensions subject to change without notice!

Model Numbers	Suction	Discharge	A	B	C	D	E	F	G	H	Weight (lbs.)
20020	3	3	46	16	1	16	42	7.5	14	5/8	350
20040	3	3	46	16	1	16	42	7.5	14	5/8	500
20060	3	3	46	16	1	16	50	7.5	14	5/8	500
20080	3	3	46	16	1	16	50	7.5	14	5/8	575
200100	3	3	46	16	1	16	53	7.5	14	5/8	650
200120	3	3	46	16	1	16	53	7.5	14	5/8	675
200140	3	3	46	16	1	16	57	7.5	14	5/8	675
200160	3	3	46	16	1	16	63	7.5	14	5/8	675
200180	3	3	46	16	1	16	63	7.5	14	5/8	690
200200	3	3	46	16	1	16	66	7.5	14	5/8	690

FEDERAL PUMP CORP

Series VSPV-Simplex Booster System

Start-Up and System Operation

SYSTEM RECEIPT INSPECTION:

- Inspect system and components for signs of damage during
- shipment.
- Check system for missing parts.
- Check system for loose parts.

SYSTEM INSTALLATION:

- Mount and anchor system in properly prepared location.
- Verify system is level and piping aligned with building
- system piping.
- Connect building piping to booster system, ensure no pipe
- stress is transferred to booster system.
- Ensure system disconnect switch is in the off position.
- Have qualified electrician route power to system disconnect switch.
- Grout system base using a "non-shrinking" grout.
- manifold.
- Hydropneumatic tank is shipped from the factory with the isolation
- valve closed. Tank must be pre-charged to system pressure
- with air prior to opening isolation valve and admitting
- water.

SYSTEM STARTUP:

- Open all system isolation valves.
- Slowly open booster system supply from building system.
- Open the petcocks on pumps and system manifolds to allow
- air to bleed from system.
- Turn disconnect switch ON.
- Jog pump motor #1 and observe direction of rotation. Take
- corrective action as required.
- Place power disconnect switch to OFF
- Charge the cushion tank (if provided with the system) to proper
- settings. Cushion tank is provided with minimum factory charge
- and must be charged based upon system requirements.
- After all air is bled from the system, place system in operation
- by placing disconnect switch to the ON position

OPERATION:

NOTE

Federal Pump VSPV booster systems are tested and adjusted at the factory prior to shipment. System pressure transducers are factory adjusted to the specifications provided at time of order. When power disconnect switch is placed in the ON position the pump will start and vary its speed to meet system requirements.

SEQUENCE OF OPERATION

General: These units control one booster pump motor to maintain the pressure in a system within a selected range.

This is accomplished with a pressure transducer which has a fixed Pressure set point programmed into the variable frequency drive.

Standard units have one system pressure transducer (located on the discharge side of the pump that measures system settings. A second pressure transducer is mounted on the suction piping that measures suction pressure and, if suction pressure falls below the set point, will terminate operation of the system and indicate the reason on the digital display. This low suction pressure cut-of is provided to protect the pump System from running dry.

PUMP OPERATION

The pressure transducer located on the discharge side of the system will monitor system pressure and cause the pump to vary its speed in order to meet system requirements. If the system requirements are met a time delay will start and upon its completion (0-15 seconds) the pump will cease operation and in stand-by mode. Once the system pressure declines, the pump will start Its sequence and vary the speed as required to meet system conditions.

SYSTEM FAILURE AND CONTROL FUNCTIONS

The VSPV system is controlled by a variable speed drive with inherent control software and alarm devices that provide automatic operation and ensure these Software programs have been installed and protected while in automatic and non-supervised operation.

Federal Pump sources the most advanced motors and electrical controls that may vary from time to time based upon the interest of continued product development and advancing software and system design. Refer to attached pages for system Control features and benefits while operating the VSPV Simplex System

FEDERAL PUMP CORP

Series VSPV-Simplex Booster System

System Operation

- Pump Genius software monitors system pressure or flow and references low / high set point and run time requirements. The lead and lag pumps are cycled on and off based on motor run times.
  - – Starting motors are selected based on run time - motor with least amount of run time
  - – Stoping motors are selected based on run time - motor with highest amount of run time
  - – All pumps are dynamically alternated based on run times and system set point requirements
  - – System faults are monitored and alarmed
  - – Motor faults are monitored and alarmed
  - – Drive faults are monitored and alarmed
  - – Up to 6 pumps dynamically alternated and controlled

Performance Features

- 2-75 HP @ 230V / 2-600HP @ 480V
- Overload capacity: nominal 110% for 60sec. (150% peak)
- Starting torque: 100% at 3 Hz
- Motor preheat function
- Adjustable accel/decel: 0.1 to 6000 sec.
- Controlled speed range: 40:1
- Critical frequency rejection: 3 selectable, adjustable bands
- Torque-limiting: 30-180%
- Energy Saving control
- Torque boost: full range, auto
- Power loss ride-thru: 2 sec
- Auto restart after power loss or resettable fault, selectable, programmable
- Feedback signal loss detection
- Serial communications loss detection
- "Up / Down" floating point control capability (PI)
- Stationary motor auto-tuning
- Pump Sleep function
- Run-permissive input

Pump Control Features

- Operator Keypad with intuitive pump language
- Hand-Off-Auto
- Programmable Pump Process Set Point
- Pump Start Level & Start Time
- Sleep Protection
- Simplex, Duplex, Triplex, and Multiplex Control
- Automatic System Restart
- No Flow Detection

Pump Control Features (cont)

- Low and High Feedback set points
- Pre-Charge Low Level Control
- Thrust Bearing Control
- Automatic System Stabilization
- Motor Condensation Pre-Heat Function

Protective Features

- Current-limited stall prevention
- Heat sink over-temperature, speed fold-back
- Bi-directional start into rotating motor
- Current-limiting DC bus fuse
- Optically-isolated controls
- Short circuit protection: Phase-phase and phase-neutral
- Ground fault protection
- Short circuit withstand rating: 100K RMS
- Electronic motor overload: UL
- Current limit
- Fault display: last 10 faults
- Fault circuit: OC, OV, OT
- Over torque and under torque protection

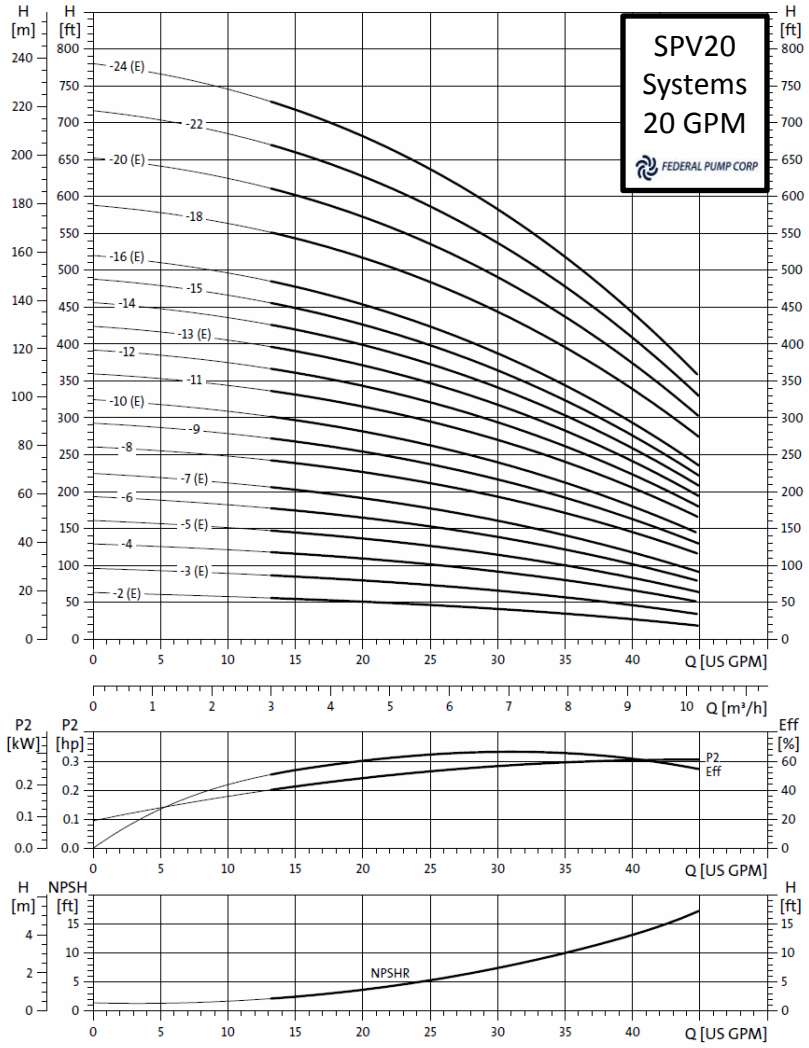
Pump Protective Features

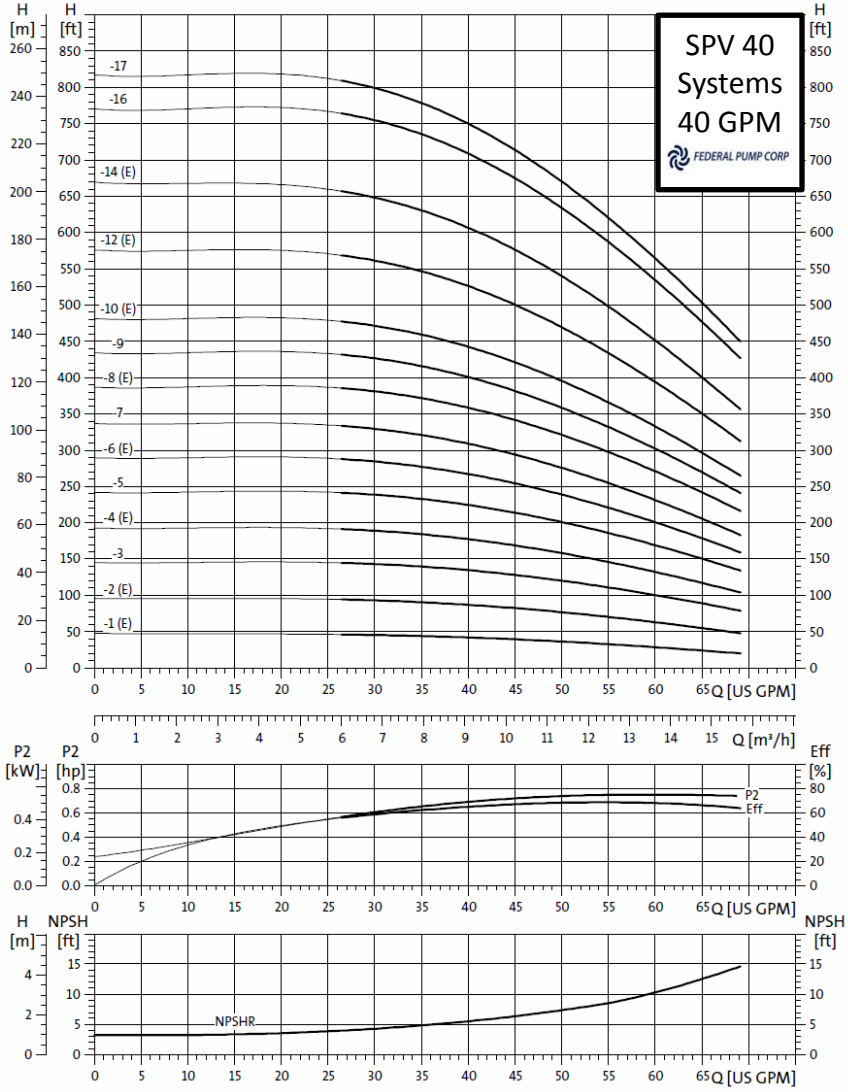
- Dry Well
- Air in System
- Blocked Impeller
- Pump over Cycling
- No Flow Protection
- Loss of Prime
- Transducer Loss
- Over Torque
- Anti-Cavitation

FEDERAL PUMP CORP

Series VSPV-Simplex Booster System

3600RPM Performance Curves





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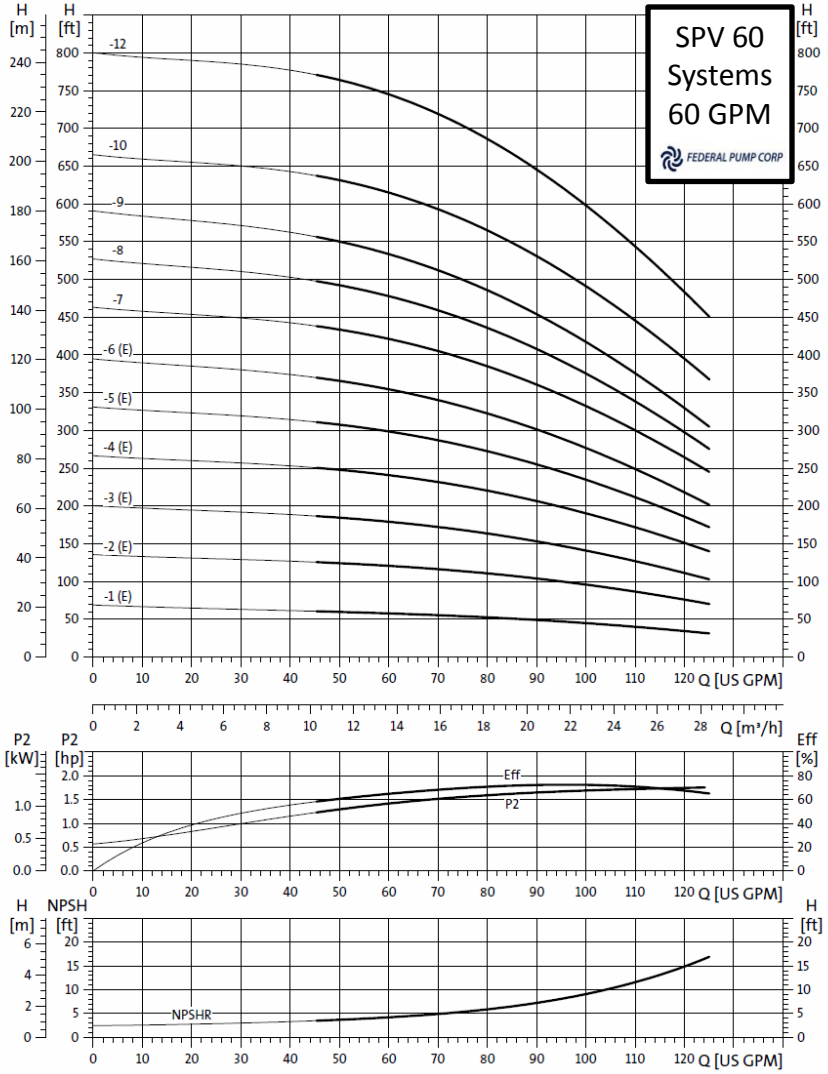

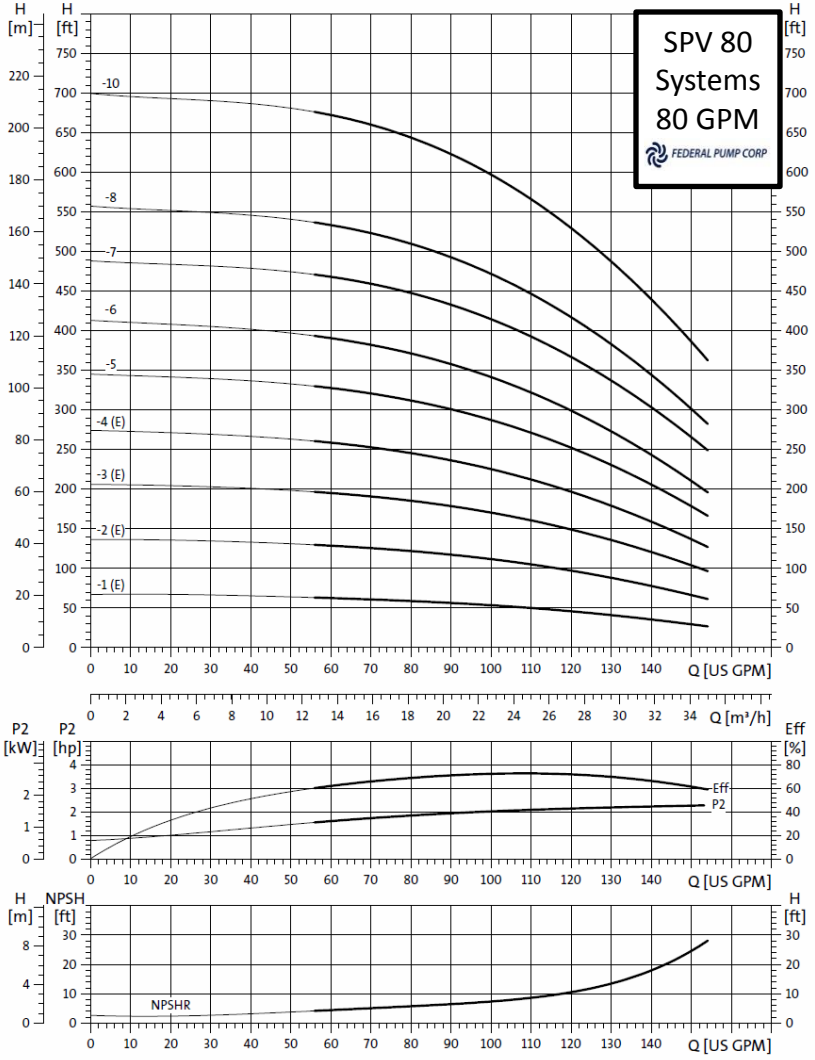

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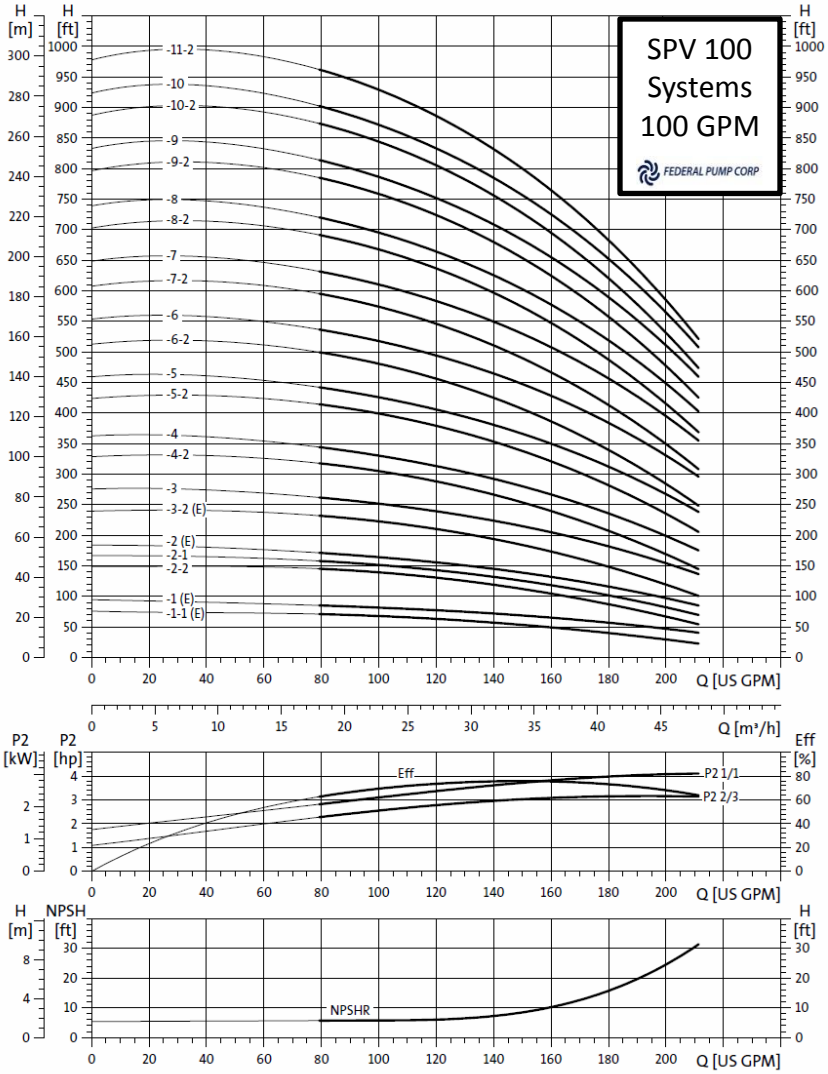

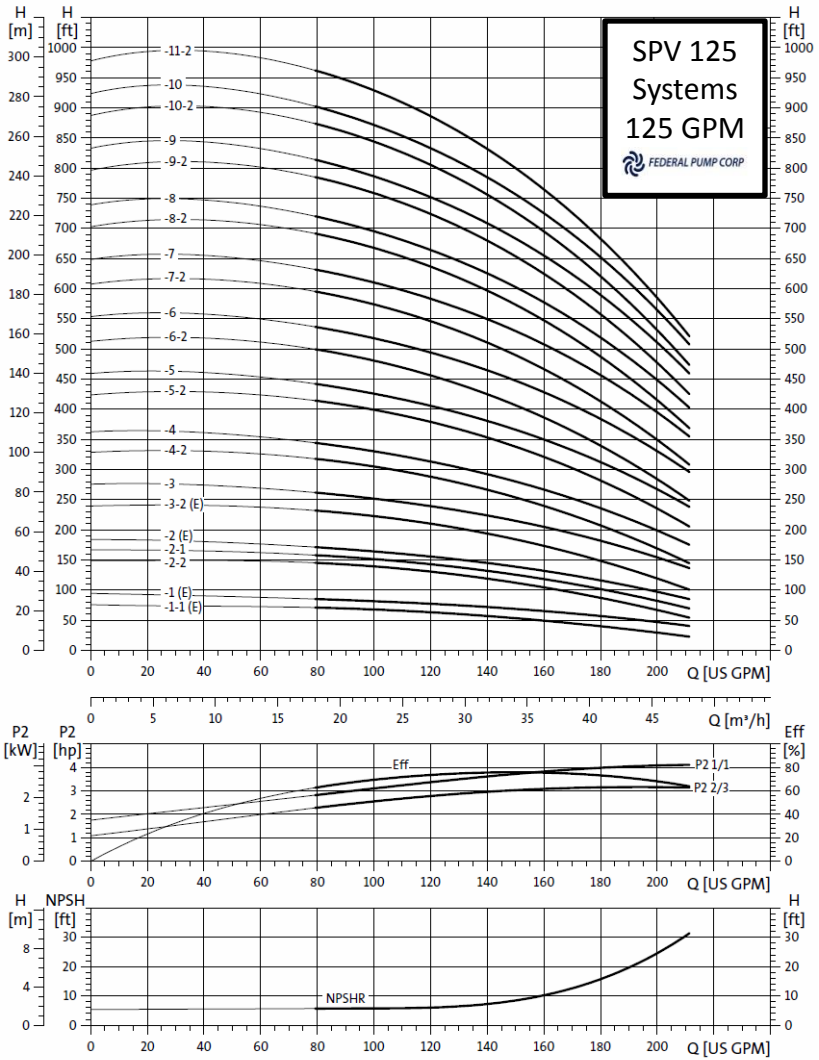

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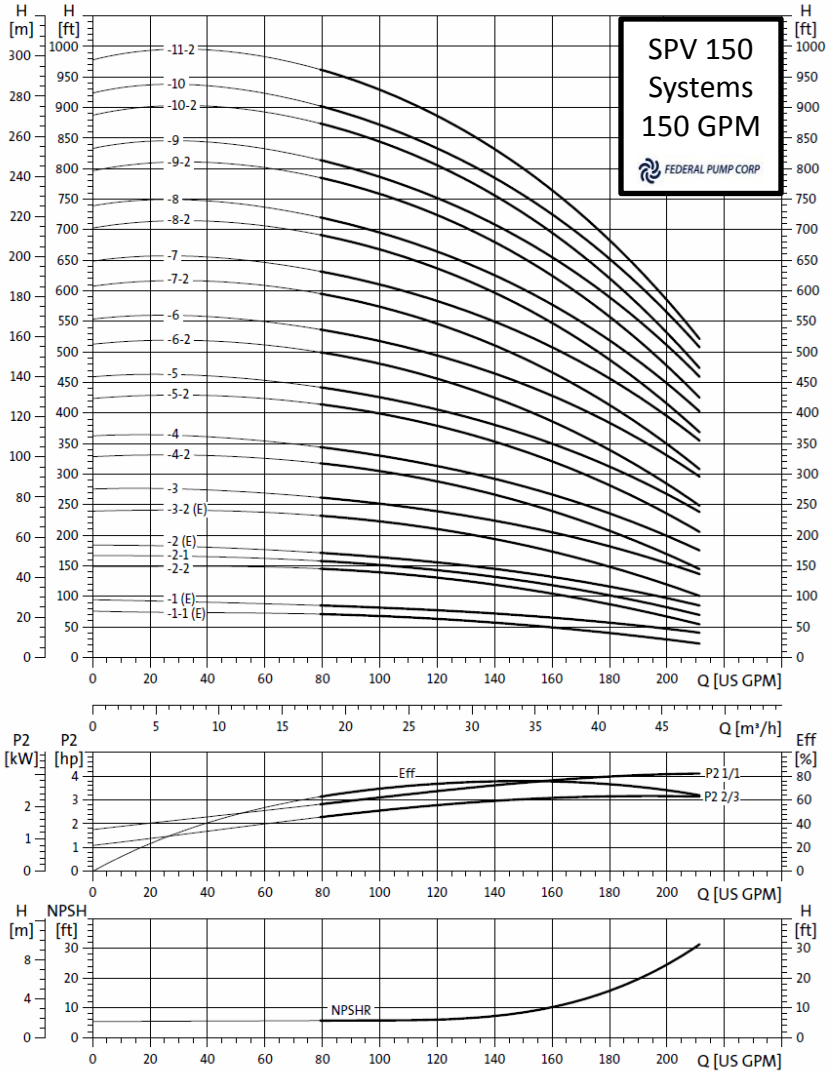

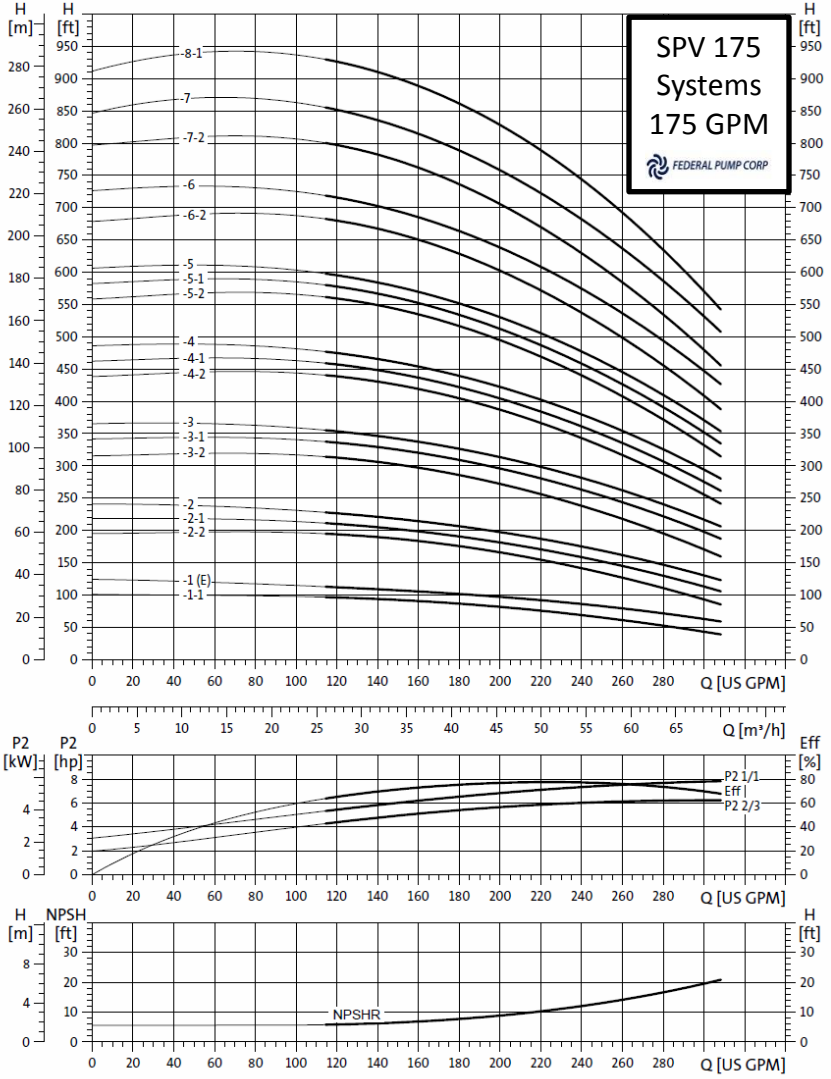

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