

TYPE
.....
VSPS

PACKAGE BOOSTER SYSTEM
(END SUCTION PUMP DESIGN)



Available

**PACKAGED PUMP SYSTEM WITH CAPACITIES
TO 300GPM, PRESSURE BOOST TO 100PSI*
WITH UP TO 25HP ON EACH PUMP**

**AVAILABLE IN DUPLEX, AND TRIPLEX
CONFIGURATION, AND FLOW MONITORING
SYSTEM WITH HMI**

*Consult local sales office for higher pressure availability

FEATURES

- ⌘ Lower Install Cost as a Package
- ⌘ Built-in Reliability
- ⌘ Energy Saving VFD
- ⌘ Quiet Operation
- ⌘ Factory tested

INTRODUCTION

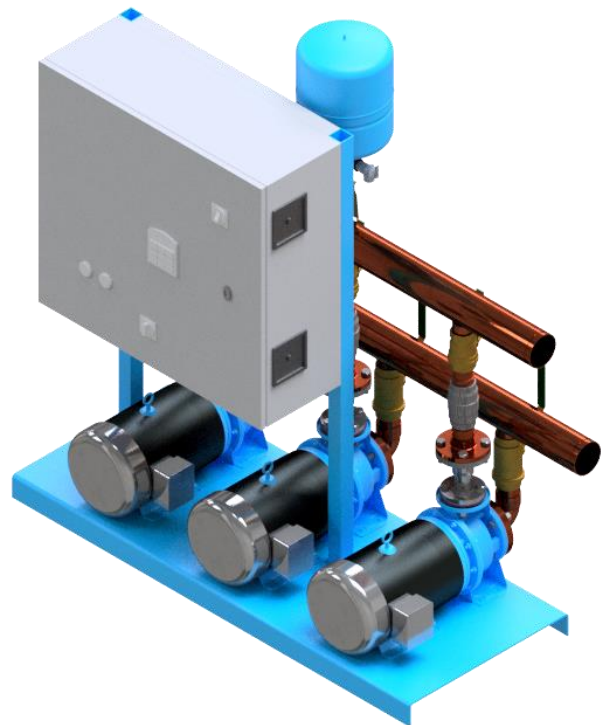
VSPS systems are pre-assembled and pre-wired units which provide steady water pressure in buildings having varying water demand and variable street pressure through the use of pressure transducers and variable speed drives

The system includes cast iron bronze fitted (or full stainless steel) ¹ construction end suction pumps with brass valving and headers, header pressure gauges, control pressure transducers, a steel base, cushion tank and integral variable speed drives. ¹: for NSF systems only

Operation of the systems is as follows:

Duplex System: The system anticipates a signal for water demand set to a water pressure. Once signaled, the lead pump turns on to pressurize the building riser. When required, the lag pump automatically starts to run in parallel with the lead pump until the water pressure is met. The lag pump will then shut down. Lead and lag pumps are automatically alternated every 24 hours.

Triplex System: The system anticipates a signal for water demand set to a water pressure. Once signed, the lead pump turns on to pressurize the building riser. When required, the lag pump automatically starts to run in parallel with the lead pump until the water level is met. The lag pump will then shut down. Lead and lag pumps are automatically alternated every 24 hours. Third pump is used for standby operation.



PRODUCT DETAILS

PUMP

Lead free cast iron bronze fitted construction end-suction design (Stainless steel construction end-suction for NSF 61/372 certified systems)

MOTOR

Factory choice of energy efficient inverter duty ready motors coupled to pump shaft

MANIFOLD

Lead-free construction suction and discharge manifold with accompaniment check and isolation valves

TRANSDUCER CONTROLS

Dedicated pressure transducer for system suction and discharge to monitor usual operation

GAUGES

Standard 100PSI and 200PSI rated pressure gauge on system manifolds

DISCONNECT AND MONITORING

Designed with local disconnect switch and monitoring digital display of pump system performance

SAFETY PRECAUTIONS

System low suction cut-out switch, and pump dedicated thermal relief valve for system protection

CONTROL SEQUENCE

Standard with back-up control toggle switch for adjustable hand operation in times of PLC failure.

BMS COMPATIBILITY

Ability to be equipped with BacNet as a BMS protocol.

CUSHION TANK

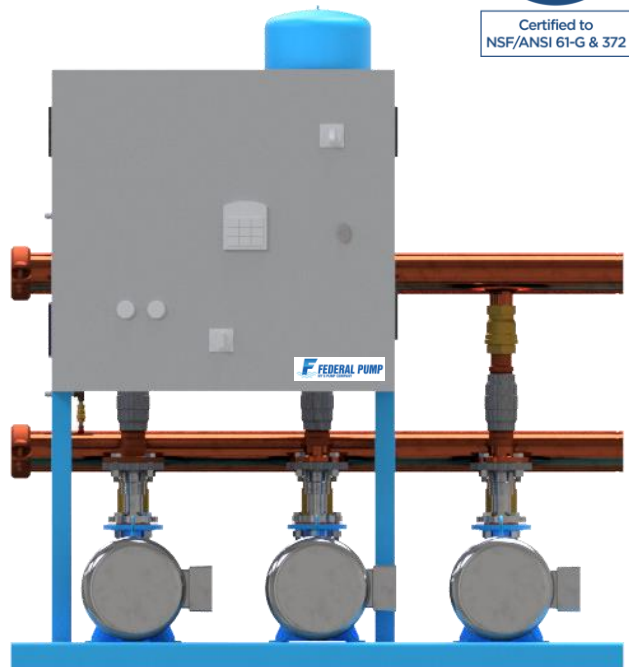
ASME certified hydro-pneumatic cushion tank for local and remote mount to assist with pump sleep duration

FLOW SENSING SPOOL (OPTIONAL)

Flow sensing spool matching to manifold size to measure the flow rate of the booster with a flow transducer with output to the control panel

NSF CERTIFICATIONS (NSF OPTIONAL)

NSF 61/371 certification available as a system option



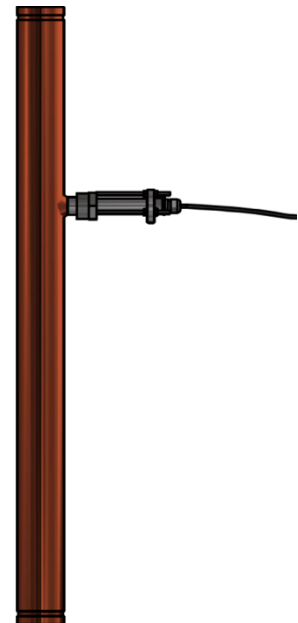
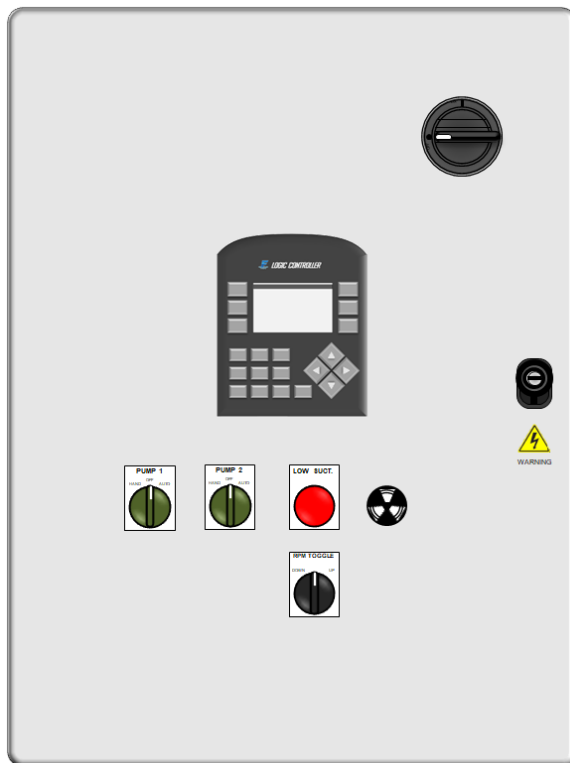
SELECTION TABLE

CONTROL DESIGN OPTIONS

The VSPS control panel is available in several options and should be reviewed in detail prior to order. Dimensions may vary based on enclosure type, horsepower size, options requested and custom specification requirements.

The options for control panel are as follows:

- **OPTION A – STANDARD OPTION** NEMA-1 Enclosure with fan, single through-the-door circuit breaker, internal disconnects, VFD controllers, H-O-A switch, alarm lights with ON/OFF button, alternation with PLC, speed control toggle switch, and Form-C dry contact for HWA.
- **OPTION B – FLOW SENSING OPTION** STANDARD OPTION components with the addition of the field installed flow transducer spool assembly.
- **OPTION X – CUSTOMIZED OPTION** Please refer to factory for customized control panel modifications.
- **NSF 61/372 OPTION** – For all systems that need NSF 61/372 certification, add “.N” after the control design option selected.



FLOW TRANSDUCER
SPOOL ASSEMBLY

SELECTION TABLE

VSPS – 4A – 4080 – 2 – 3D – 2

SYSTEM SERIES

CONNECTION SIZE ¹

SEE SELECTION TABLE

DESIGN OPTION (ADD .N FOR NSF 61/372 CERTIFICATION) ²

SEE PAGE 4 FOR DESIGN OPTIONS AVAILABLE

PERFORMANCE RATING

NO. OF POLES IN MOTORS

INPUT PHASE & VOLTAGE ³

3/208V = 3B 3/230V = 3C 3/460V = 3D

MULTIPLEX ⁴

SIMPLEX = 1 DUPLEX = 2 TRIPLEX = 3

MODEL NO	PERFORMANCE		MOTOR H.P. (NSF H.P.)	CONNECTION SIZE	
	G.P.M.	HEAD PER PUMP [PSI (FT)]		DUPLEX □ ¹ [IN]	TRIPLEX □ ¹ [IN]
VSPS-□ ¹ □ ² -4020-2-□ ³ -□ ⁴	40	20 (46)	1.5 (1)	3	3
VSPS-□ ¹ □ ² -4030-2-□ ³ -□ ⁴		30 (69)	1.5 (1.5)		
VSPS-□ ¹ □ ² -4040-2-□ ³ -□ ⁴		40 (92)	1.5 (2)		
VSPS-□ ¹ □ ² -4050-2-□ ³ -□ ⁴		50 (116)	2 (3)		
VSPS-□ ¹ □ ² -4060-2-□ ³ -□ ⁴		60 (139)	3 (5)		
VSPS-□ ¹ □ ² -4070-2-□ ³ -□ ⁴		70 (162)			
VSPS-□ ¹ □ ² -4080-2-□ ³ -□ ⁴		80 (185)	5 (5)		
VSPS-□ ¹ □ ² -4090-2-□ ³ -□ ⁴		90 (208)			
VSPS-□ ¹ □ ² -40100-2-□ ³ -□ ⁴		100 (231)	7.5 (10)		
VSPS-□ ¹ □ ² -6020-2-□ ³ -□ ⁴	60	20 (46)	1.5 (1.5)	3	3
VSPS-□ ¹ □ ² -6030-2-□ ³ -□ ⁴		30 (69)	2 (3)		
VSPS-□ ¹ □ ² -6040-2-□ ³ -□ ⁴		40 (92)	3 (3)		
VSPS-□ ¹ □ ² -6050-2-□ ³ -□ ⁴		50 (116)	5 (5)		
VSPS-□ ¹ □ ² -6060-2-□ ³ -□ ⁴		60 (139)			
VSPS-□ ¹ □ ² -6070-2-□ ³ -□ ⁴		70 (162)			
VSPS-□ ¹ □ ² -6080-2-□ ³ -□ ⁴		80 (185)	7.5 (5)		
VSPS-□ ¹ □ ² -6090-2-□ ³ -□ ⁴		90 (208)	7.5 (10)		
VSPS-□ ¹ □ ² -60100-2-□ ³ -□ ⁴		100 (231)	10 (10)		

*Refer to factory for the pump's operational performance over its entire range.

SELECTION TABLE

MODEL NO	PERFORMANCE		MOTOR H.P. (NSF H.P.)	CONNECTION SIZE	
	G.P.M.	HEAD PER PUMP [PSI (FT)]		DUPLEX □ ¹ [IN]	TRIPLEX □ ¹ [IN]
VSPS-□ ¹ □ ² -8020-2-□ ³ -□ ⁴	80	20 (46)	1.5 (3)	3	3
VSPS-□ ¹ □ ² -8030-2-□ ³ -□ ⁴		30 (69)	3 (3)		
VSPS-□ ¹ □ ² -8040-2-□ ³ -□ ⁴		40 (92)	5 (3)		
VSPS-□ ¹ □ ² -8050-2-□ ³ -□ ⁴		50 (116)	5 (5)		
VSPS-□ ¹ □ ² -8060-2-□ ³ -□ ⁴		60 (139)	7.5 (5)		
VSPS-□ ¹ □ ² -8070-2-□ ³ -□ ⁴		70 (162)	7.5 (7.5)		
VSPS-□ ¹ □ ² -8080-2-□ ³ -□ ⁴		80 (185)	7.5 (10)		
VSPS-□ ¹ □ ² -8090-2-□ ³ -□ ⁴		90 (208)	10 (10)		
VSPS-□ ¹ □ ² -80100-2-□ ³ -□ ⁴		100 (231)	15 (15)		
VSPS-□ ¹ □ ² -10020-2-□ ³ -□ ⁴	100	20 (46)	1.5 (3)	3	4
VSPS-□ ¹ □ ² -10030-2-□ ³ -□ ⁴		30 (69)	3 (5)		
VSPS-□ ¹ □ ² -10040-2-□ ³ -□ ⁴		40 (92)	5 (5)		
VSPS-□ ¹ □ ² -10050-2-□ ³ -□ ⁴		50 (116)			
VSPS-□ ¹ □ ² -10060-2-□ ³ -□ ⁴		60 (139)	7.5 (7.5)		
VSPS-□ ¹ □ ² -10070-2-□ ³ -□ ⁴		70 (162)	10 (10)		
VSPS-□ ¹ □ ² -10080-2-□ ³ -□ ⁴		80 (185)			
VSPS-□ ¹ □ ² -10090-2-□ ³ -□ ⁴		90 (208)	15 (10)		
VSPS-□ ¹ □ ² -100100-2-□ ³ -□ ⁴		100 (231)	15 (15)		
VSPS-□ ¹ □ ² -12020-2-□ ³ -□ ⁴	120	20 (46)	2 (5)	3	4
VSPS-□ ¹ □ ² -12030-2-□ ³ -□ ⁴		30 (69)	3 (5)		
VSPS-□ ¹ □ ² -12040-2-□ ³ -□ ⁴		40 (92)	5 (7.5)		
VSPS-□ ¹ □ ² -12050-2-□ ³ -□ ⁴		50 (116)	7.5 (7.5)		
VSPS-□ ¹ □ ² -12060-2-□ ³ -□ ⁴		60 (139)	7.5 (10)		
VSPS-□ ¹ □ ² -12070-2-□ ³ -□ ⁴		70 (162)	10 (10)		
VSPS-□ ¹ □ ² -12080-2-□ ³ -□ ⁴		80 (185)	15 (15)		
VSPS-□ ¹ □ ² -12090-2-□ ³ -□ ⁴		90 (208)			
VSPS-□ ¹ □ ² -120100-2-□ ³ -□ ⁴		100 (231)			

*Refer to factory for the pump's operational performance over its entire range.

SELECTION TABLE

MODEL NO	PERFORMANCE		MOTOR H.P. (NSF H.P.)	CONNECTION SIZE	
	G.P.M.	HEAD PER PUMP [PSI (FT)]		DUPLEX □ ¹ [IN]	TRIPLEX □ ¹ [IN]
VSPS-□ ¹ □ ² -14020-2-□ ³ -□ ⁴	140	20 (46)	3 (5)	4	4
VSPS-□ ¹ □ ² -14030-2-□ ³ -□ ⁴		30 (69)	5 (5)		
VSPS-□ ¹ □ ² -14040-2-□ ³ -□ ⁴		40 (92)	7.5 (5)		
VSPS-□ ¹ □ ² -14050-2-□ ³ -□ ⁴		50 (116)	7.5 (7.5)		
VSPS-□ ¹ □ ² -14060-2-□ ³ -□ ⁴		60 (139)	10 (10)		
VSPS-□ ¹ □ ² -14070-2-□ ³ -□ ⁴		70 (162)	10 (15)		
VSPS-□ ¹ □ ² -14080-2-□ ³ -□ ⁴		80 (185)	15 (15)		
VSPS-□ ¹ □ ² -14090-2-□ ³ -□ ⁴		90 (208)	15 (15)		
VSPS-□ ¹ □ ² -140100-2-□ ³ -□ ⁴		100 (231)	20 (15)		
VSPS-□ ¹ □ ² -16020-2-□ ³ -□ ⁴	160	20 (46)	3 (5)	4	6
VSPS-□ ¹ □ ² -16030-2-□ ³ -□ ⁴		30 (69)	5 (5)		
VSPS-□ ¹ □ ² -16040-2-□ ³ -□ ⁴		40 (92)	7.5 (5)		
VSPS-□ ¹ □ ² -16050-2-□ ³ -□ ⁴		50 (116)	10 (10)		
VSPS-□ ¹ □ ² -16060-2-□ ³ -□ ⁴		60 (139)	10 (10)		
VSPS-□ ¹ □ ² -16070-2-□ ³ -□ ⁴		70 (162)	15 (15)		
VSPS-□ ¹ □ ² -16080-2-□ ³ -□ ⁴		80 (185)	15 (15)		
VSPS-□ ¹ □ ² -16090-2-□ ³ -□ ⁴		90 (208)	20 (15)		
VSPS-□ ¹ □ ² -160100-2-□ ³ -□ ⁴		100 (231)	20 (15)		
VSPS-□ ¹ □ ² -18020-2-□ ³ -□ ⁴	180	20 (46)	5 (5)	4	6
VSPS-□ ¹ □ ² -18030-2-□ ³ -□ ⁴		30 (69)	5 (5)		
VSPS-□ ¹ □ ² -18040-2-□ ³ -□ ⁴		40 (92)	7.5 (7.5)		
VSPS-□ ¹ □ ² -18050-2-□ ³ -□ ⁴		50 (116)	10 (10)		
VSPS-□ ¹ □ ² -18060-2-□ ³ -□ ⁴		60 (139)	10 (10)		
VSPS-□ ¹ □ ² -18070-2-□ ³ -□ ⁴		70 (162)	15 (15)		
VSPS-□ ¹ □ ² -18080-2-□ ³ -□ ⁴		80 (185)	15 (15)		
VSPS-□ ¹ □ ² -18090-2-□ ³ -□ ⁴		90 (208)	20 (15)		
VSPS-□ ¹ □ ² -180100-2-□ ³ -□ ⁴		100 (231)	20 (15)		

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SELECTION TABLE

MODEL NO	PERFORMANCE		MOTOR H.P. (NSF H.P.)	CONNECTION SIZE	
	G.P.M.	HEAD PER PUMP [PSI (FT)]		DUPLEX □ ¹ [IN]	TRIPLEX □ ¹ [IN]
VSPS-□ ¹ □ ² -20020-2-□ ³ -□ ⁴	200	20 (46)	5 (5)	4	6
VSPS-□ ¹ □ ² -20030-2-□ ³ -□ ⁴		30 (69)	7.5 (5)		
VSPS-□ ¹ □ ² -20040-2-□ ³ -□ ⁴		40 (92)	7.5 (7.5)		
VSPS-□ ¹ □ ² -20050-2-□ ³ -□ ⁴		50 (116)	10 (10)		
VSPS-□ ¹ □ ² -20060-2-□ ³ -□ ⁴		60 (139)	15 (15)		
VSPS-□ ¹ □ ² -20070-2-□ ³ -□ ⁴		70 (162)	15 (15)		
VSPS-□ ¹ □ ² -20080-2-□ ³ -□ ⁴		80 (185)	15 (15)		
VSPS-□ ¹ □ ² -20090-2-□ ³ -□ ⁴		90 (208)	20 (15)		
VSPS-□ ¹ □ ² -200100-2-□ ³ -□ ⁴		100 (231)	25 (30)		
VSPS-□ ¹ □ ² -22020-2-□ ³ -□ ⁴	220	20 (46)	5 (5)	6	6
VSPS-□ ¹ □ ² -22030-2-□ ³ -□ ⁴		30 (69)	7.5 (5)		
VSPS-□ ¹ □ ² -22040-2-□ ³ -□ ⁴		40 (92)	10 (10)		
VSPS-□ ¹ □ ² -22050-2-□ ³ -□ ⁴		50 (116)	15 (10)		
VSPS-□ ¹ □ ² -22060-2-□ ³ -□ ⁴		60 (139)	15 (15)		
VSPS-□ ¹ □ ² -22070-2-□ ³ -□ ⁴		70 (162)	15 (15)		
VSPS-□ ¹ □ ² -22080-2-□ ³ -□ ⁴		80 (185)	20 (15)		
VSPS-□ ¹ □ ² -22090-2-□ ³ -□ ⁴		90 (208)	25 (15)		
VSPS-□ ¹ □ ² -220100-2-□ ³ -□ ⁴		100 (231)	25 (30)		
VSPS-□ ¹ □ ² -24020-2-□ ³ -□ ⁴	240	20 (46)	5 (7.5)	6	6
VSPS-□ ¹ □ ² -24030-2-□ ³ -□ ⁴		30 (69)	7.5 (7.5)		
VSPS-□ ¹ □ ² -24040-2-□ ³ -□ ⁴		40 (92)	10 (10)		
VSPS-□ ¹ □ ² -24050-2-□ ³ -□ ⁴		50 (116)	10 (10)		
VSPS-□ ¹ □ ² -24060-2-□ ³ -□ ⁴		60 (139)	15 (15)		
VSPS-□ ¹ □ ² -24070-2-□ ³ -□ ⁴		70 (162)	20 (15)		
VSPS-□ ¹ □ ² -24080-2-□ ³ -□ ⁴		80 (185)	20 (25)		
VSPS-□ ¹ □ ² -24090-2-□ ³ -□ ⁴		90 (208)	25 (25)		
VSPS-□ ¹ □ ² -240100-2-□ ³ -□ ⁴		100 (231)	30 (30)		

*Refer to factory for the pump's operational performance over its entire range.

SELECTION TABLE

MODEL NO	PERFORMANCE		MOTOR H.P. (NSF H.P.)	CONNECTION SIZE	
	G.P.M.	HEAD PER PUMP [PSI (FT)]		DUPLEX □ ¹ [IN]	TRIPLEX □ ¹ [IN]
VSPS-□ ¹ □ ² -26020-2-□ ³ -□ ⁴	260	20 (46)	5 (7.5)	6	6
VSPS-□ ¹ □ ² -26030-2-□ ³ -□ ⁴		30 (69)	7.5 (7.5)		
VSPS-□ ¹ □ ² -26040-2-□ ³ -□ ⁴		40 (92)	10 (10)		
VSPS-□ ¹ □ ² -26050-2-□ ³ -□ ⁴		50 (116)	15 (10)		
VSPS-□ ¹ □ ² -26060-2-□ ³ -□ ⁴		60 (139)	15 (15)		
VSPS-□ ¹ □ ² -26070-2-□ ³ -□ ⁴		70 (162)	20 (20)		
VSPS-□ ¹ □ ² -26080-2-□ ³ -□ ⁴		80 (185)	25 (25)		
VSPS-□ ¹ □ ² -26090-2-□ ³ -□ ⁴		90 (208)	30 (25)		
VSPS-□ ¹ □ ² -260100-2-□ ³ -□ ⁴		100 (231)	30 (30)		
VSPS-□ ¹ □ ² -28020-2-□ ³ -□ ⁴	280	20 (46)	7.5 (7.5)	6	6
VSPS-□ ¹ □ ² -28030-2-□ ³ -□ ⁴		30 (69)	7.5 (10)		
VSPS-□ ¹ □ ² -28040-2-□ ³ -□ ⁴		40 (92)	10 (10)		
VSPS-□ ¹ □ ² -28050-2-□ ³ -□ ⁴		50 (116)	15 (10)		
VSPS-□ ¹ □ ² -28060-2-□ ³ -□ ⁴		60 (139)	20 (15)		
VSPS-□ ¹ □ ² -28070-2-□ ³ -□ ⁴		70 (162)	20 (20)		
VSPS-□ ¹ □ ² -28080-2-□ ³ -□ ⁴		80 (185)	25 (25)		
VSPS-□ ¹ □ ² -28090-2-□ ³ -□ ⁴		90 (208)	30 (30)		
VSPS-□ ¹ □ ² -280100-2-□ ³ -□ ⁴		100 (231)			
VSPS-□ ¹ □ ² -30020-2-□ ³ -□ ⁴	300	20 (46)	7.5 (7.5)	6	6
VSPS-□ ¹ □ ² -30030-2-□ ³ -□ ⁴		30 (69)	7.5 (10)		
VSPS-□ ¹ □ ² -30040-2-□ ³ -□ ⁴		40 (92)	15 (10)		
VSPS-□ ¹ □ ² -30050-2-□ ³ -□ ⁴		50 (116)	15 (15)		
VSPS-□ ¹ □ ² -30060-2-□ ³ -□ ⁴		60 (139)	20 (15)		
VSPS-□ ¹ □ ² -30070-2-□ ³ -□ ⁴		70 (162)	20 (20)		
VSPS-□ ¹ □ ² -30080-2-□ ³ -□ ⁴		80 (185)	25 (25)		
VSPS-□ ¹ □ ² -30090-2-□ ³ -□ ⁴		90 (208)	30 (30)		
VSPS-□ ¹ □ ² -300100-2-□ ³ -□ ⁴		100 (231)			

*Refer to factory for the pump's operational performance over its entire range.

SUGGESTED SPECIFICATIONS – STANDARD DUPLEX VFD

General Product Overview: Furnish and install where shown in the plans a Federal Pump Series VSPS Duplex 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 to the system panel and a single suction and single discharge piping connection. All other wiring and piping internal to the prefabricated system will be provided by the pump manufacturer. Pump system shall be warranted for a period of 1 year from the date of shipment

System Materials: System shall include end suction pumps each rated GPM and PSI as shown in the plans. Motor HP, RPM and voltage shall be supplied to meet system design conditions and rated as shown in the plans. Pumps shall be cast iron bronze fitted construction (stainless steel construction for NSF 61/372) and provided with mechanical seals. Interconnecting piping shall be supplied in copper construction up to 400GPM in total flow – *for total design flow over 400GPM, all piping shall be in stainless steel construction*. All potable water pump system materials will exceed SDWA -2014 requirement. Pumps, valves piping and controls shall be fabricated and tested for 100 percent performance range testing and hydrostatic tested to 125 percent of design pressure. System shall include suction and discharge mounted pressure gauges for visual indication of system performance.

System Controls: Booster system will be provided with individual pump variable frequency drives sequenced through multiplexing design and provided with a system pressure transducers. The pressure transducer will be installed in the system discharge manifold and monitor system pressure set point. Each variable frequency drive will be provided with a power disconnect switch that will control the power to the drive. The pressure transducer will provide a 4-20mA proportional signal to each drive to increase or decrease the speed of the pump and ensure system design conditions are maintained. Each variable frequency drive will include HOA selector switch, programmable pump process set point, operator keypad with intuitive pump language, multiplex controller where drives interact with one another in meeting system requirements, digital readout of RPM, pressure, delay timers (sleep protection) for pump off operation, auto restart after power loss, alternation based upon run times and system set point requirements, low suction pressure cutout and alarm signal.

Sequence of Operation: The system pressure transducers will monitor the discharge pressure of the system to ensure system pressure requirements are maintained. In the event of a drop in system pressure below the set point the pressure transducer will signal the variable speed drive to initiate lead pump 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. If system demand is not met and pressure falls below the set point, the lag pump will start and run in parallel with the lead pump to meet system conditions. 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 these set points. Upon meeting system conditions the lag pump will terminate operation followed by the lead pump after a timed delay. The system will select the lead pump for the next cycle based upon a designated cycle time.

Low Suction Cut-Off: In the event of low suction condition, the suction pressure cut-off switch 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 contractor, the pump manufacturer's representative will review the installation to ensure proper connections, witness the performance of the VSPS System from 0 to 100% system pressure and monitor and test low suction pressure cut-off and document completion of the commissioned system. The representative will train the onsite personnel in operating the system. If the system is equipped with a charged cushion tank, the pump manufacturer's representative will ensure the tank is charged to the appropriate pre-charge condition to ensure proper operation of the system.

Design Option: For system designed to operate with a flow transducer spool assembly, the spool will be provided in the material construction and diameter matching the system manifold. Field installation and wiring is necessary. Please refer to the system IO&M that is shipped with the equipment for installation instructions. The flow transducer will give an analog signal to the system control panel to display the system's flow rate in GPM on the HMI.

Installation & Operation manuals: A complete set of system installation and operation manuals will be shipped with system.

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

Warranty: The pump manufacturer will provide a one year limited warranty for material and workmanship and take unit responsibility of the system components.

SUGGESTED SPECIFICATIONS – STANDARD TRIPLEX VFD

General Product Overview: Furnish and install where shown in the plans a Federal Pump Series VSPS Triplex 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 to the system panel and a single suction and single discharge piping connection. All other wiring and piping internal to the prefabricated system will be provided by the pump manufacturer. Pump system shall be warranted for a period of 1 years from the date of shipment

System Materials: System shall include end suction pumps each rated GPM and PSI as shown in the plans. Motor HP, RPM and voltage shall be supplied to meet system design conditions and rated as shown in the plans. Pumps shall be cast iron bronze fitted construction (stainless steel construction for NSF 61/372) and provided with mechanical seals. Interconnecting piping shall be supplied in copper construction up to 400GPM in total flow – *for total design flow over 400GPM, all piping shall be in stainless steel construction*. All potable water pump system materials will exceed SDWA -2014 requirement. Pumps, valves piping and controls shall be fabricated and tested for 100 percent performance range testing and hydrostatic tested to 125 percent of design pressure. System shall include suction and discharge mounted pressure gauges for visual indication of system performance.

System Controls: Booster system will be provided with individual pump variable frequency drives sequenced through multiplexing design and provided with a system pressure transducers. The pressure transducer will be installed in the system discharge manifold and monitor system pressure set point. Each variable frequency drive will be provided with a power disconnect switch that will control the power to the drive. The pressure transducer will provide a 4-20mA proportional signal to each drive to increase or decrease the speed of the pump and ensure system design conditions are maintained. Each variable frequency drive will include HOA selector switch, programmable pump process set point, operator keypad with intuitive pump language, multiplex controller where drives interact with one another in meeting system requirements, digital readout of RPM, pressure, delay timers (sleep protection) for pump off operation, auto restart after power loss, alternation based upon run times and system set point requirements, low suction pressure cutout and alarm signal.

Sequence of Operation: The system pressure transducers will monitor the discharge pressure of the system to ensure system pressure requirements are maintained. In the event of a drop in system pressure below the set point the pressure transducer will signal the variable speed drive to initiate lead pump 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. If system demand is not met and pressure falls below the set point, the lag pump will start and run in parallel with the lead pump to meet system conditions. 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 these set points. Upon meeting system conditions the lag pump will terminate operation followed by the lead pump after a timed delay. The third pump in the triplex system shall be used as a standby pump in case of failure on the lead or lag pump. Once the system goes to sleep, it will select the lead pump for the next cycle based upon a designated cycle time.

Low Suction Cut-Off: In the event of low suction condition, the suction pressure cut-off switch 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 contractor, the pump manufacturer's representative will review the installation to ensure proper connections, witness the performance of the VSPS System from 0 to 100% system pressure and monitor and test low suction pressure cut-off and document completion of the commissioned system. The representative will train the onsite personnel in operating the system. If the system is equipped with a charged cushion tank, the pump manufacturer's representative will ensure the tank is charged to the appropriate pre-charge condition to ensure proper operation of the system.

Design Option: For system designed to operate with a flow transducer spool assembly, the spool will be provided in the material construction and diameter matching the system manifold. Field installation and wiring is necessary. Please refer to the system IO&M that is shipped with the equipment for installation instructions. The flow transducer will give an analog signal to the system control panel to display the system's flow rate in GPM on the HMI.

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Warranty: The pump manufacturer will provide a one year limited warranty for material and workmanship and take unit responsibility of the system components.

PERFORMANCE DATA

ITEM	DESCRIPTION	MAXIMUM AMP DRAW RATING PER PUMP			
		HP	208V	230V	460V
MANIFOLD SIZES	3"Ø ~ 6" Ø	1	2.7	2.5	1.2
HORSEPOWER RANGE	2 ~ 30HP	1.5	4.1	3.7	1.8
PERFORMANCE RANGE	40 ~ 300 GPM	2	8.1	7.3	3.7
MAX. WATER TEMPERATURE	140°F	3	11.5	10	5.2
PUMP CASING	CLASS 30 CAST IRON (304 STAINLESS STEEL) ¹	5	20	18	9.1
		7.5	25	23	11
IMPELLER	LEAD-FREE CASTED BRONZE (304 STAINLESS STEEL) ¹	10	40	36	18
		15	52	47	23
SHAFT	303 STAINLESS STEEL	20	57	52	26
MANIFOLDS	COPPER(STAINLESS STEEL) ¹	25	64	57	29
FASTENERS	304 STAINLESS STEEL	30	83	75	38
TRANSDUCER	316 STAINLESS STEEL WETTED				
CUSHION TANK SIZE	5 GALLONS ²				
CUSHION TANK LINER	POLYPROPYLENE				
BASE PLATE	BENT STEEL				

BOOSTER SYSTEM WEIGHT [LB]

HP	DUPLEX	TRIPLEX
1-2	500	600
3-5	600	800
7.5-10	800	1000
15	1000	1300
20	1200	1500
25	1200	1900
30	1400	2200

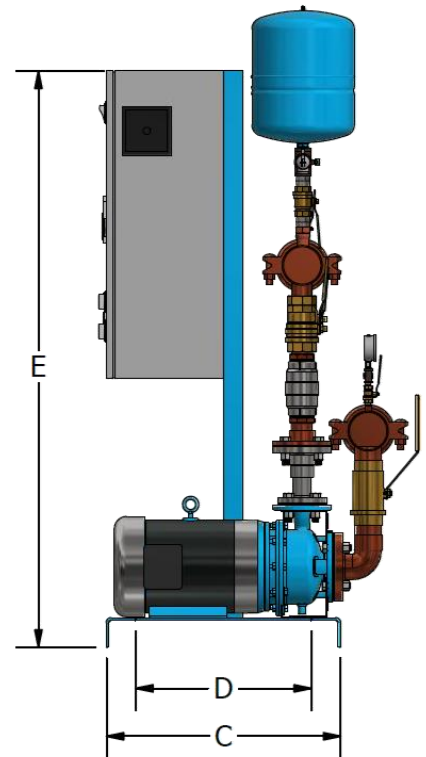
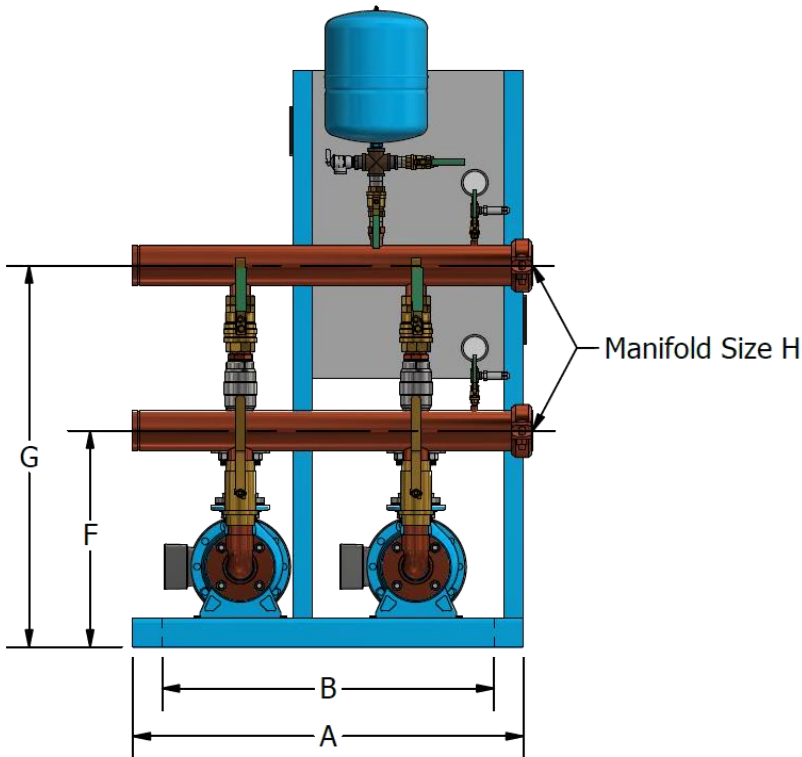
FLOW TRANSDUCER SPOOL ASSEMBLY

F.T. SPOOL SIZE	WEIGHT [LB]
FOR 3"DIA COPPER MANIFOLD	70
FOR 4"DIA COPPER MANIFOLD	100
FOR 6"DIA S.S. MANIFOLD	190

NOTES:

- Material used for NSF 61/372 certified systems
- Standard use of cushion tank is 5 Gallons. Refer to factory for larger size cushion tanks– which are not system mounted.
 - The weight of the system is for Design A or B only, with a deviation of +/- 5%. Add flow transducer spool assembly for Design B.
 - Refer to factory for all custom design system construction & weight.

SYSTEM DIMENSIONS (DUPLEX)



HP	A	B	C	D	E	
1	40	34	24	18	59	
1.5						
2						
3						
5						
7.5	48	42	29	23		
10						
15			38	32		
20						
25						
30						

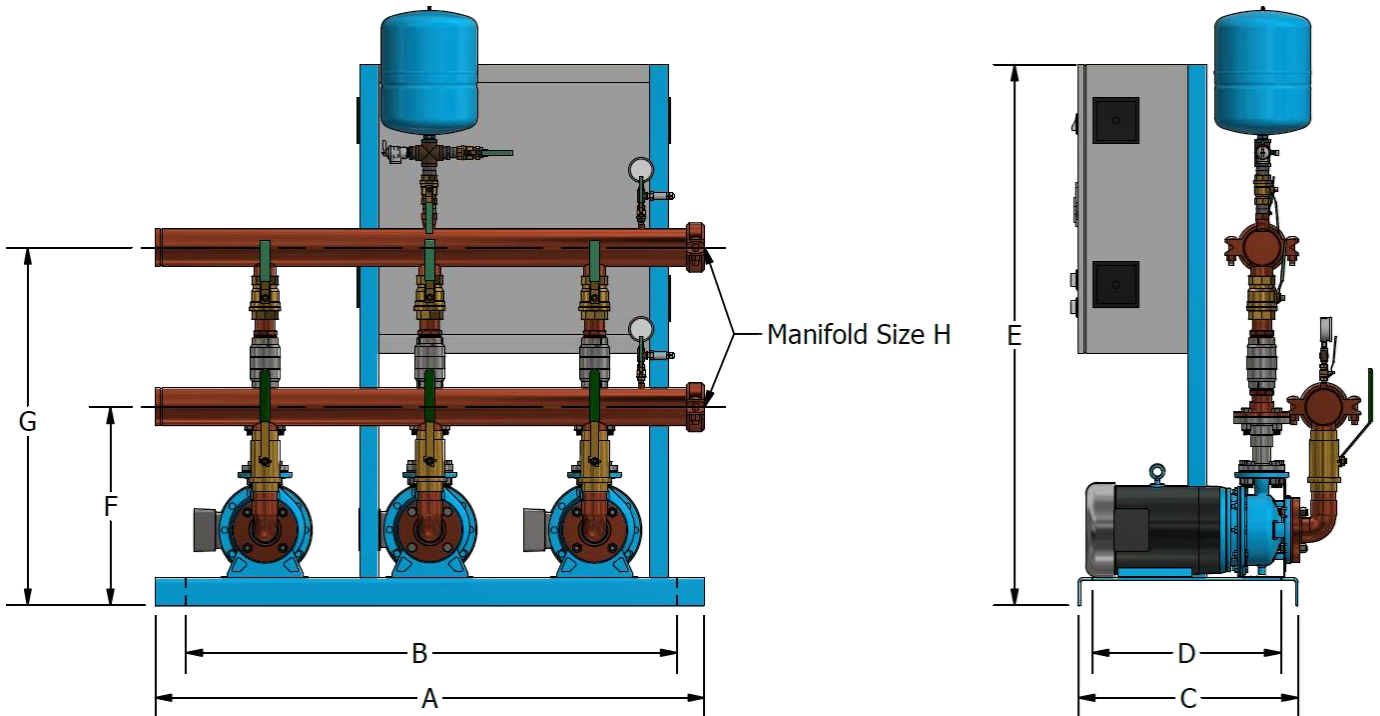
F	Pump Horsepower
22.5	Up to 3
R.T.F	Above 3

G	Pump Horsepower
R.T.F	ALL

H	Total System GPM
3"	Up to 240
4"	241 ~ 400
6"	More than 400

NOTES: Refer to factory (R.T.F) for custom system dimensions. All dimensions are within the tolerance of +/- 1 inch

SYSTEM DIMENSIONS (TRIPLEX)



HP	A	B	C	D	E	
1	58	52	24	18	59	
1.5						
2						
3						
5						
7.5	72	66	29	23		
10						
15			38	32		
20						
25						
30						

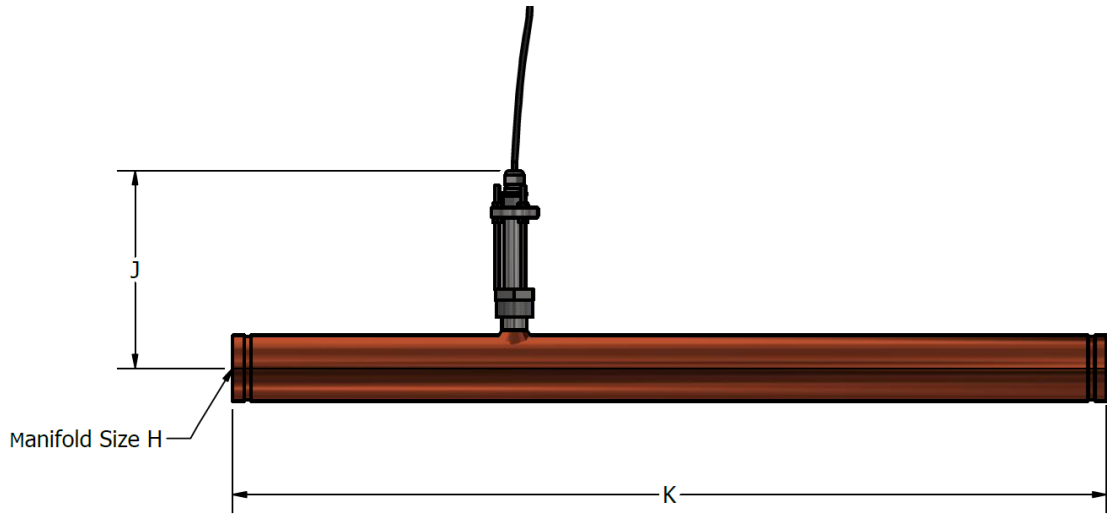
F	Pump Horsepower
22.5	Up to 2
R.T.F	Above 2

G	Pump Horsepower
R.T.F	ALL

H	Total System GPM
3	Up to 240
4	241 ~ 400
6	More than 400

NOTES: Refer to factory (R.T.F) for custom system dimensions. All dimensions in inch and are within the tolerance of +/- 1 inch

SYSTEM DIMENSIONS (SPOOL)



H	Material	J	K
3	Copper	9	48
4	Copper	9.25	60
6	Stainless Steel	10	90

NOTES: Refer to factory (R.T.F) for custom system dimensions. All dimensions in inch and are within the tolerance of +/- 1 inch

Since 1927 Federal Pump has been a leading provider of reliable and innovative fluid handling solutions for supply water management and dewatering pump services.

Its recent introduction of the VSPV & VSPM variable speed domestic water supply system combines innovative technological advancements in premium efficient motors and variable speed drive support programs that reduce energy demand, lower operating costs, and provide more finely tuned supply controls.

Its VSA/VSP vertical pump rated to 210F provides solutions in dewatering applications where condensate or boiler feed water are collected and then cooled and pumped to city sewer connections providing continuous service where submersible pumps do not provide a sustainable solution.

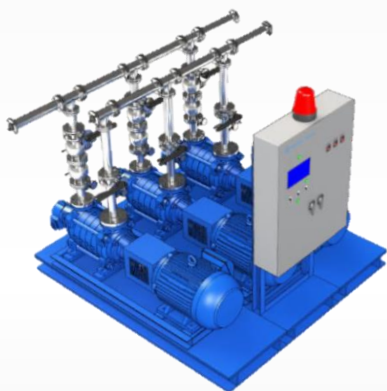
The SOSP Oil Shield sump pumps alert building management to potential oil leaks in the elevator areas providing additional building support.

High rise roof fill applications, water make-up systems for mechanical equipment utilizing rain water systems and energy efficient condensate, boiler feed, and vacuum condensate units continue in the focus of energy efficiency and building support.

In the tradition of leadership through product innovation, quality designs, and reliable customer service, Federal Pump continues to be a supplier to those water management and dewatering markets where it first started that tradition of leadership in Brooklyn, N.Y.



**Variable Speed Booster
Model VSPV(up to 300PSI)**



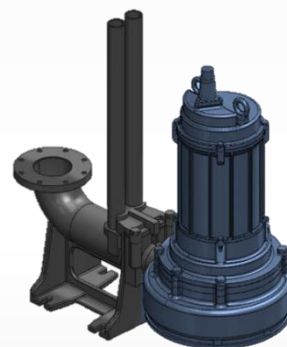
**Variable Speed Booster
Model VSPM(up to 600PSI)**



**Oil Shield Elevator Sump System
Model SOSP(up to 125GPM)**



**Vertical Sewage/Sump Pump
Model VSA/VSP(up to 1400GPM)**



**Submersible Sewage/Sump Pump
Model MSC(QD)/VSS(QD) (up to
500GPM)**



**Condensate/Boiler Feed System
Model CCV/BFC(up to 100,000EDR)**