

**Variable Primary Flow
 Chilled Water
 Packaged Pumping System
 Model VPF**

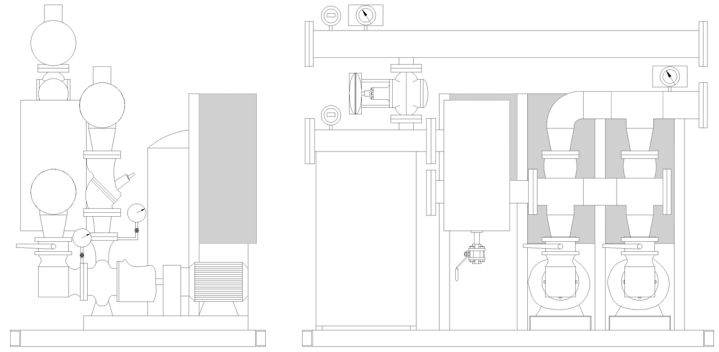
The Model VPF, Variable Primary Flow Chilled Water Packaged Pumping System is a UL-listed factory assembled and tested system used in conventional building cooling systems which utilizes Chilled Water as the cooling source. The VPF provides significant power savings by use of a variable speed pump to simultaneously provide water to the chiller and to the building system. **Variable Frequency Drives** automatically control the speed of the pumps based on actual building system demand. Typically, Differential Pressure Transmitters are placed across building cooling system zones. The transmitters signal to the VPF System Controller which controls a **Variable Frequency Drive** for each variable speed, chilled water pump. Minimum required chiller flow is automatically maintained by a flow meter mounted on the inlet of each chiller. The system chillers cool the chilled water to 44°F and are automatically staged on/off based on actual building system demand from controllers energy consumption monitor. Actual building system energy consumption is displayed on the controller's touch screen operator interface. The Model VPF provides air-free chilled water, while automatically refilling under normal system losses. The VPF also allows for system thermal expansion based on the building system volume. A UL-listed System Controller with single-point power connection is pre-wired to all electrical sources. **Variable Frequency Drives** may incorporate Manual or Automatic bypasses. Each system is custom engineered and designed to meet specific system requirements. All systems are fabricated and welded per ASME Section IX Code and Standards, and are Hydrostatically tested prior to shipment. The Model VPF speeds installation and start-up of building cooling systems which provide significant savings to contractors, engineers, and building owners.

STANDARD CONSTRUCTION

- Structural Channel Base
- Carbon Steel Piping
- Operational Testing
- Pump Isolation Valves
- Hydrostatically Tested
- High Temperature Industrial Enamel Paint

CONDITIONS OF OPERATION

Max. Allowable Pressure:	125 psig / 8.6 bar
Max. Allowable Temperature:	240 °F / 115.5 °C



Legend:

- A. Base-mounted, End-suction Centrifugal Pump
- B. Triple Duty Valve
- C. Air Separator with Auto Air Vent
- D. Expansion Tank
- E. System Inlet / Outlet Thermometers
- F. Pump Differential Pressure Gauge
- G. UL-listed System Controller
- H. Variable Frequency Drive
- I. Make-up Water Assembly

SYSTEM OPTIONS

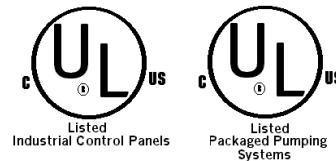
- Stand-by pumps
- Suction Diffuser
- Panel-mounted Gauges
- Flexible Connectors
- Vibration Isolation

MODEL VPF SAVINGS

Pump Speed (%)	Input Power (%)	Potential Savings (\$ /yr.)
100	100	\$0
90	73	\$4,329
80	51	\$7,856
70	34	\$10,581
60	22	\$12,505
50	13	\$13,948
40	6	\$15,070
30	3	\$15,551

NOTES:

1. Savings are based on max. potential savings at max. pump capacity on 8600 hr./yr. of continuous operation.
2. Power costs at \$0.10/kW-hr.
3. Savings assume continuous operation of one (1) 25 Hp Pump.
4. Savings based on approx. calculations.



**Model VPF
Chilled Water
Packaged Pumping System Order Form**

Form 00-VPF

Specify the following parameters:

I. System Cooling Load = _____ BTU/hr

II. System Differential
Pressure Required = _____ psid

III. System Inlet
Pressure = _____ psig

IV. Return Temperature = 54 °F

V. Supply Temperature = 44 °F

VI. System Electrical = _____ V _____ Hz

VII. System Volume = _____ Gal.

Note: System medium assumed to be water, unless otherwise specified.

SYSTEM OPTIONS

Stand-by Pump

Pressure Gauges

Pump Suction Diffuser

Vertical In-line Pump

Split-coupled Vertical In-line Pump

Closed-coupled end-suction Centrifugal Pump

Auto standby pump start on lead pump failure

Auto Pump Alternation

Remote start connection

Variable Frequency Drive

Manual Bypass

Automatic Bypass

Panel-mounted Differential Pressure Gauges

Pump Run Time Hour Meter

Outdoor use Rating

Outdoor Cabinet

System Inlet/Outlet Isolation Valves

System Flow Switch

Differential Pressure Switch across Pump
suction/discharge

System drain valves

Flexible Connectors

Vibration Isolation

Glycol Make-up System

Regardless of system size, temperature, pressure, fluid medium, or space requirements, **EnviroSep** can provide solutions to all specialized needs.

EnviroSep • Fluid & Heat Recovery Systems
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PO Box 857 • Georgetown, SC 29442
Phone (843) 546-7400 / Fax (843) 546-7407
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Typical Specifications for VPF

Furnish and install one **EnviroSep** Model VPF- [A] - [B] - [C] - [D] Chilled Water Packaged Pumping System with the system capacity to cool _____ BTU/hr of _____ (fluid) from 54 °F to 44 °F when _____ psig is available at the System Return.

KEY:

[A] = Model # (BTU/hr)

[B] = # of pumps (1,2,3,etc.)

[C] = Parallel (P) or Stand-by (S) pump designation

[D] = Manual (M) or Automatic (A) alternation for multiple pumps

GENERAL - This package shall be factory assembled with pump(s), air separator, expansion tank, triple duty valves, fabricated steel frame, interconnection piping(welded per ASME Section IX certified welders), UL-listed Industrial Control Panel factory wired for single-point field connection per NEC.

PUMPS-Pump(s) shall be single, end-suction type with radically split, top center-line discharge, self-venting casing. Pump construction shall be cast iron, bronze fitted and shall be fitted with a long-life, product lubricated, drip tight mechanical seal, with O-ring seat retainer. Impeller shaft to be 416SS fitted with a SS shaft sleeve and be supported by two heavy duty ball bearings. The design shall allow back pull out servicing, enabling the complete rotating assembly to be removed without disturbing casing piping connections. The pump shall be mounted on a rigid, single base plate and by flexible with guard to the motor. Seal shall be rated for continuous duty at 270°F, motor shall be open drip proof, NEMA MG-1 with 1.15 service factor

VARIABLE FREQUENCY DRIVE – Variable Frequency Drive shall be variable torque AC inverter enclosed in NEMA 1 or 12 enclosure. Standard features shall include circuit breaker disconnect, Hand-Off-Auto selector switch, manual potentiometer (speed pot), door-mounted keypad, run relay contacts, fault relay contacts, and top/bottom conduit entry. Drive bypass shall be provided as standard with Drive-Off-Bypass selector switch. Class 20 overloads are included.

SYSTEM CONTROLLER – Controller shall include all controls necessary to operate the system as a stand-alone system. The PLC-based controller shall be of the same manufacturer as the Packaged Pumping System. Controller shall include Remote/Local system start capability. Acceptance of up to 16 remote 4-20 ma signals shall be provided for modulation of pump speed, and other optional control functions. Enclosure shall be NEMA 12 with thru-the-door disconnect. Operator Interface shall be a color touch screen type. Controller shall include independent PID control loop for each remote signal.

AIR REMOVAL EQUIPMENT- System shall include one

tangential air separator with internal stainless steel collector tube. Connections to be flanged with a rating of 150 psig. System shall be equipped with ¾" Pressure Relief Valve, ¾" Pressure Regulating Valve, ASME Expansion Tank (sized by or provide system volume and temperature difference), and tank fitting, sight glass, and tank drain connections to tank. Bladder-type expansion tank may be substituted as alternate.

TRIPLE DUTY VALVE- System shall include, on the discharge of each pump, a combination valve incorporating three functions in one body: tight shut-off, spring closure type silent non-slam check, and flow measured/throttling. Valve body shall be ductile iron with two ¼" NPT connections on each side of the valve seat. The valve disc shall be bronze plug disc type with high impact engineered resin seat to ensure tight shut-off and silent check valve operation. Valve stem shall be SS with flat surfaces provided for adjustment with open end wrench.

SUCTION DIFFUSER- System shall include, on the suction of each pump a suction diffuser with cast iron body, outlet guide vanes and removable SS strainer.

MANUFACTURER - Shall assume system liability, and performance guarantee and warranty all equipment on system for 12 months after initial shipment as indicated in standard Terms and Conditions.

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