

ENVIROFLO

HYDRONIC PUMPING SOLUTIONS

*Energy Efficient Solutions in
HVAC Pumping*



ENVIROFLO
HYDRONIC PUMPING SOLUTIONS

The Pump People
Patterson

A Gorman-Rupp Company



Cost-effective quality. Flexibility. Interchangeability. Expert applications support. The fastest delivery in the marketplace for standard units. And **GREEN**.

Applying more than a century of engineering expertise in hydronic pumping technology to HVAC applications. That's EnviroFlo™ Hydronic Pumping Solutions from Patterson.



ENVIROFLO
HYDRONIC PUMPING SOLUTIONS



Lifecycle support...testing, training and service...

Our highly engineered pumps are thoroughly tested, including hydrostatic pressure testing, in our fully equipped laboratory. This enables our engineers to verify design and performance specifications and ensures reliable service for you year after year.

Also, we are one of the few worldwide pump manufacturers who offer coordinated factory training in the proper operation and maintenance of our pumping products. And our teams of field and factory experts always stand ready to provide our customers with dedicated personal service, whether it's a complete pump rebuild, a single part or the answer to a simple question.



The Pump People®

Horizontal Split Case HVAC Pumps

Optimized design for extended life and efficient service.



EnviroFlo Horizontal Split Case Pumps offer a high-efficiency design that minimizes energy consumption for a more Green sustainable HVAC system. And they are easy to service without disturbing piping connections. Just flip the lid on the HSC pump and you have a clear view of the entire rotating element, making it easy to service internal components.



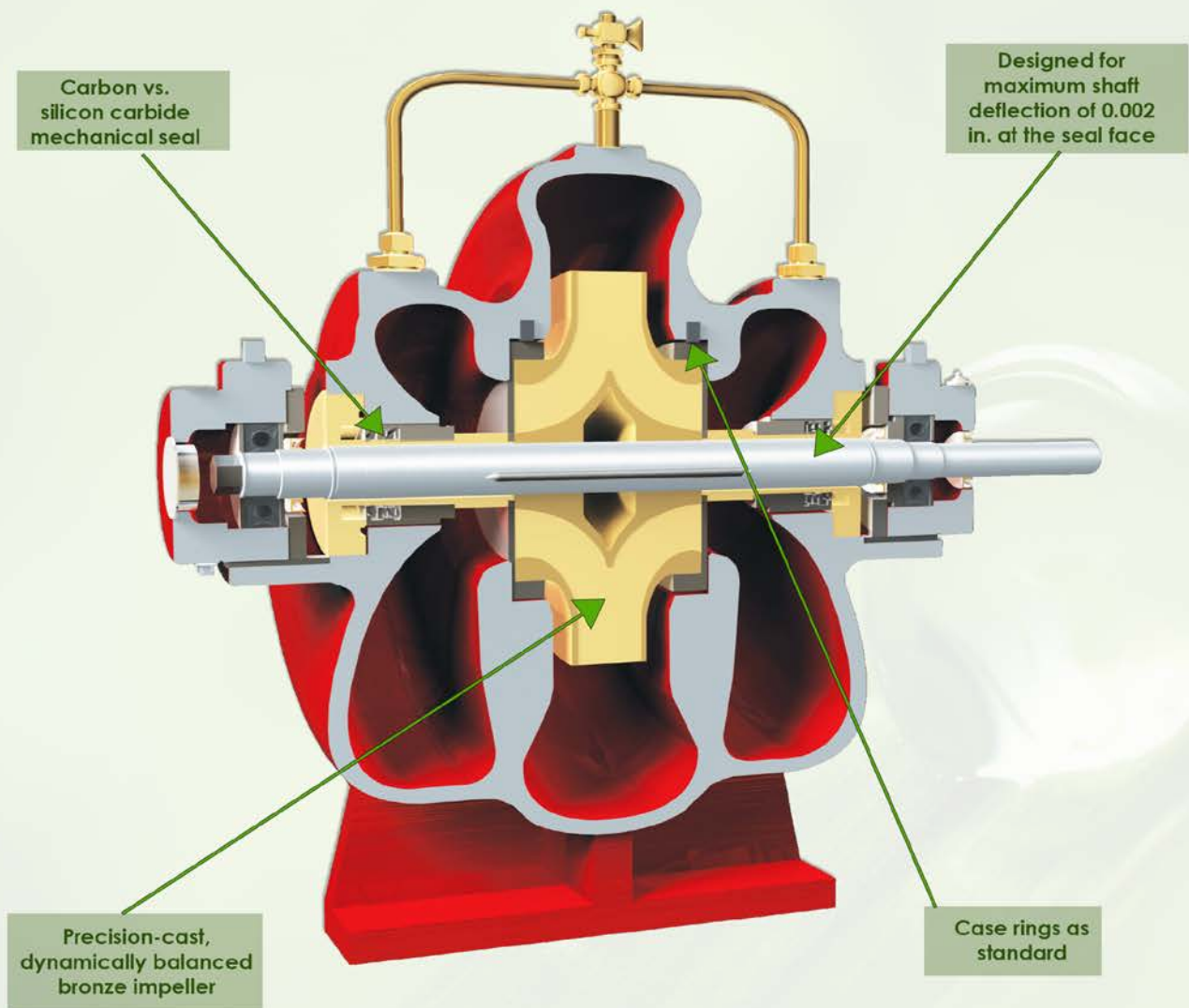
Patterson engineers have shortened the distance between inboard and outboard bearings on these pumps to reduce the cantilever effect on the pump shaft and cut deflection at the seal faces. This results in long seal and case ring service intervals. Pumps are also delivered with standard silicon carbide mechanical seals (tungsten carbide optional) and standard flush seal lines.

Standard regreaseable ball bearings are set in integrally cast bearing housings. Bronze fitted construction, with replaceable bronze shaft sleeves, is also standard; an optional stainless steel shaft and sleeve are available. A precision-cast, dynamically balanced bronze impeller minimizes vibration and maximizes bearing life.

EnviroFlo HSC pump bodies are formed from Class 30 cast iron (optional ductile iron) with a carbon steel shaft (stainless steel is optional). Designed to deliver energy efficient flows. These pumps offer standard case working pressure at 175 psi; optional 250 psi is available on select models. Gauge taps at the suction and discharge connections give complete monitoring flexibility.



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East Hartford High School—EnviroFlo Horizontal Split Case Pumps met critical construction schedule demands with easy, groutless base installation. Now they're providing high efficiency primary/secondary chilled water and condenser water movement for reliable student/teacher comfort.

The Pump People®

End Suction HVAC Pumps

Minimize energy consumption for **GREEN** benefits.



Available in both frame-mounted and closecoupled configurations, EnviroFlo End Suction Pumps will maximize the operation of your HVAC systems for years to come. Available in flows to 2,500 gpm and heads to 400 ft tdh, each pump is engineered Green through and through, delivering high-efficiency performance that minimizes operating and energy costs.



Built to last, the precision-cast, dynamically balanced bronze impeller in every pump minimizes vibration and maximizes bearing life, while annular pressure reducing clearance and impeller balance holes reduce axial thrust. Case wear ring, flush seal lines and grease-lubricated bearings are standard.

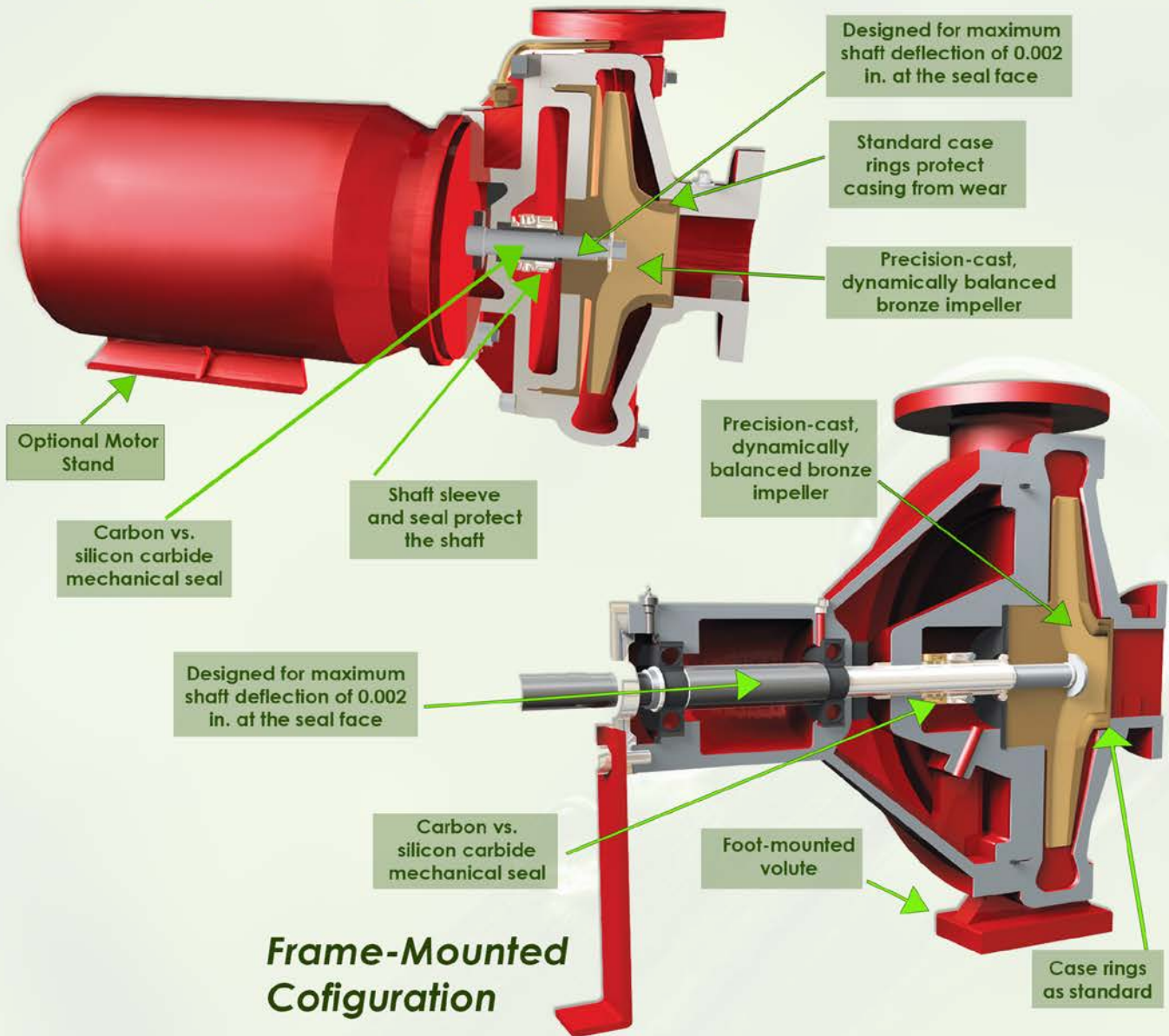
To simplify maintenance without disturbing piping connections or removing the motor, a back pullout configuration, including a sliding motor base, provides easy access to internal parts. Gauge taps at the suction and discharge connections allow for easy operational status monitoring.

The bearing housing mounts directly to the pump volute to save space and provide proper alignment. A heavy structural steel channel base does not require grouting, but it is recommended.

Case working pressure is 175 psi with 250 psi available on select models.



Close-Coupled Configuration



Rhode Island School of Design—EnviroFlo Frame-Mounted End Suction and Vertical In-Line Pumps are maintaining critical climate control requirements in a 128-year-old library while minimizing energy consumption.

The Pump People®

Vertical In-Line HVAC Pumps

Supporting energy sustainability with efficient performance.



With a legacy of quality and durability, EnviroFlo Vertical In-Line Pumps offer reliability and full flexibility to overcome constraints and serve all types of HVAC applications. Both split-coupled and closecoupled configurations are available in a high-efficiency design that minimizes energy consumption and prolongs service life.

A precision-cast, dynamically balanced bronze impeller minimizes vibration while maximizing bearing life. A case wear ring, flush seal lines, grease-lubricated bearings and a variable speed rated coupling are standard.



EnviroFlo Vertical In-Line Pumps are designed for easy maintenance. A back pullout configuration provides easy access to interior areas without disturbing piping connections. The split coupling design is available in 5 hp or larger, and a double suction impeller is available on largest sizes (12 in. and 14 in.).

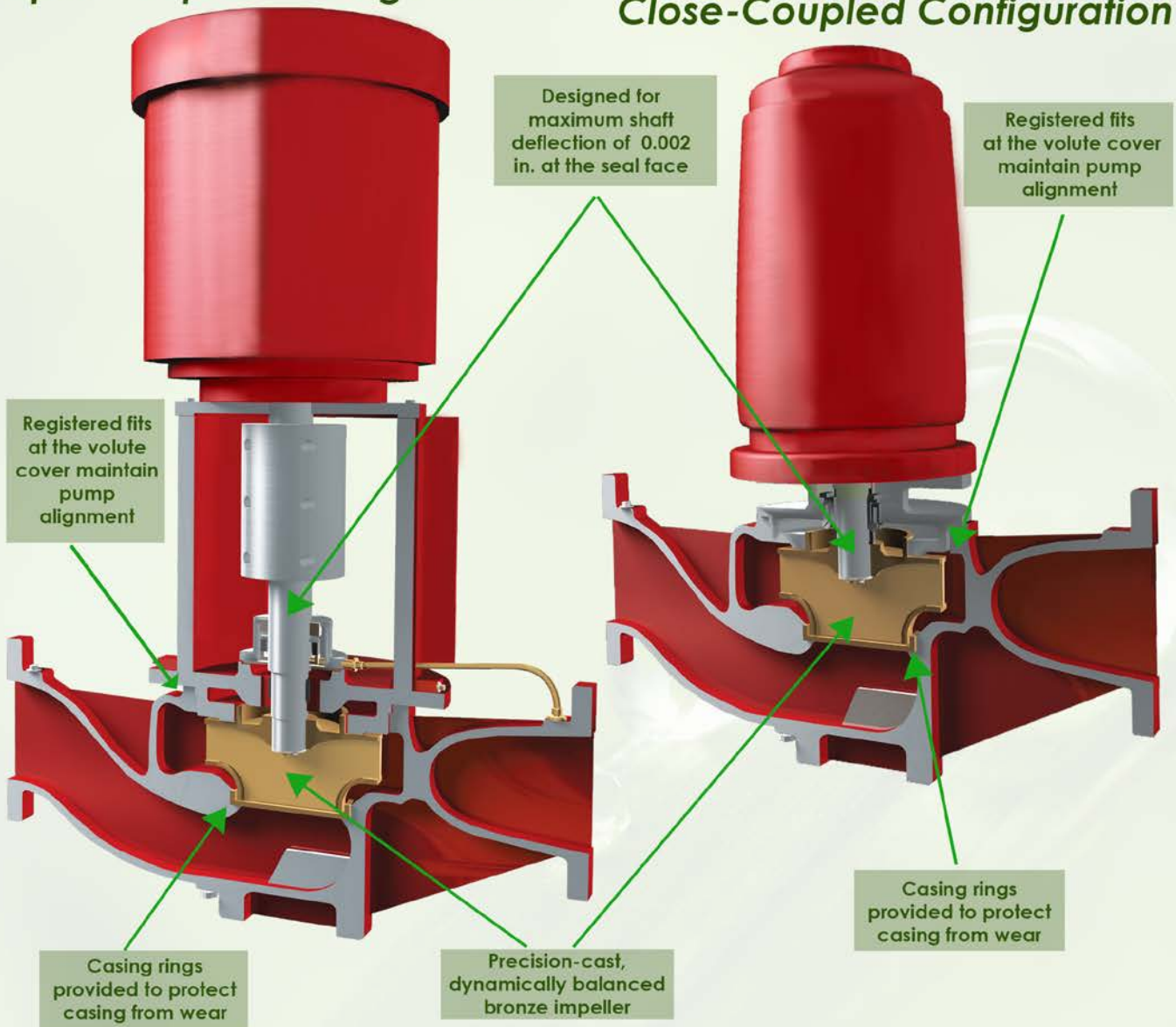
The bearing housing mounts directly to the pump volute to save space and provide proper alignment. An optional, heavy structural steel channel base is available for floor-mounted versions. While it does not require grouting, it is recommended. Flush seal lines are standard.

Case working pressure is 175 psi with 250 psi available on select models.



Split-Coupled Configuration

Close-Coupled Configuration



Woolworth Building—EnviroFlo Close-Coupled Vertical In-Line Pumps are providing worldclass quality and reliability as they circulate condenser water to 18 units on three floors of this world-renowned structure in NYC.

The Pump People®

The VFD Way To Efficient Pumping In ANY SIZE Hydronic System...

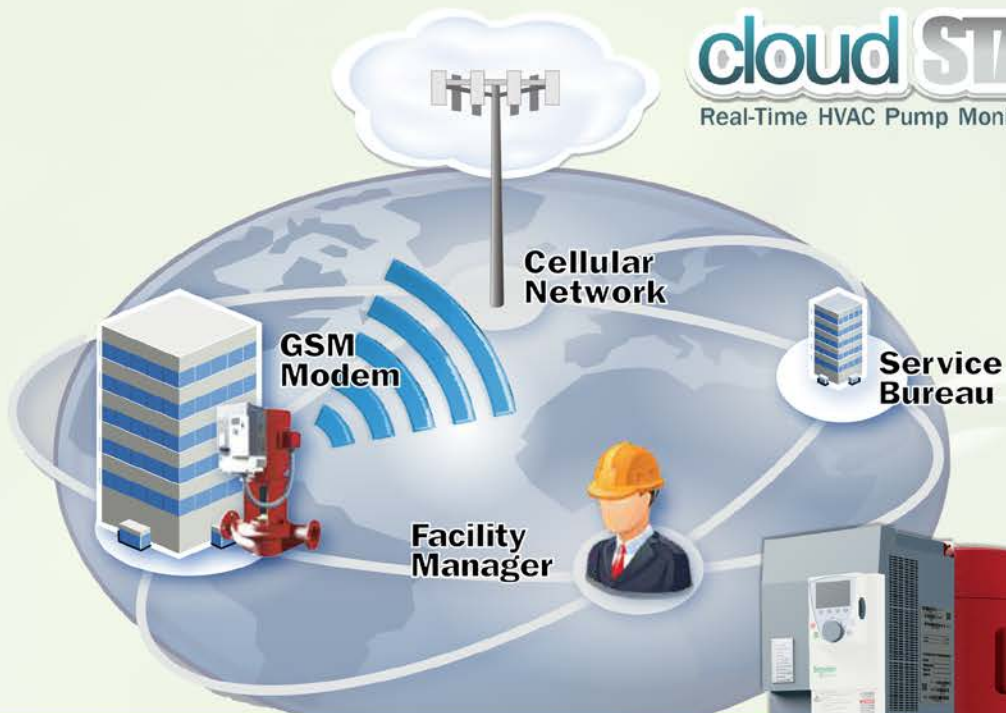
...With A Cloud's Eye View Of Status. Enjoy the advantages of Variable Frequency Drive power in sensor or sensorless Vertical In-Line (VIL) series pump configurations. Slash pumping costs by 50% with these **ASHRAE 90.1-compliant** systems.

For larger systems with sensors. Schneider Electric™ Altivar ATV212 and ATV61 Variable Frequency Drives (VFDs), regulating power to Patterson's VIL series HVAC pumps, eliminate the need for pressure reducing or throttling valves or inlet guide vanes. These compact drives reduce installation costs and maximize building occupant comfort with accurate flow control.

The drives offer the latest in VFD technology to help keep total harmonic distortion (THD) levels within the limits of the IEEE 519-1992. These drives are specifically designed to comply with IEC/EN 61000-3-12, which limits THDI of system components to 35%. Additionally, these drives feature resonant frequency skipping, soft starting and stopping, under-load and over-load detection and time limits for operating at minimum speed.

For smaller systems—the sensorless option. With no differential pressure transducers necessary, Schneider-Electric Altivar Process VFDs provide easy and space efficient installation in simple systems. In addition, they offer the highest possible performance with Patterson VIL pumps through changing load conditions:

- Operation closest to the pumps' best efficiency point (BEP)
 - New insights into pumping performance through remote communications
 - Energy drift detection in real time preventing abnormal conditions and premature equipment wear
 - Low harmonic distortion—48% THDi
 - Troubleshooting and maintenance reduced by 20%— dynamic QR code generation
- Beyond peak performance, the drive communicates all the information you need:
- Embedded Ethernet with web server and customizable dashboards protected by Achilles Level 2 cyber security
 - Embedded monitoring of pump efficiency load curves
 - Embedded power measurement at accuracy rate below 5%
 - Energy dashboards with meaningful information on consumed energy
 - Customizable alarm management system
 - Logging of all events to assist in managing predictive maintenance



With CloudStat[®] monitoring, supervisors can remotely monitor the outstanding efficiency and status of VIL series pumps powered by new Variable Frequency Drives.

Patterson VFD VIL HVAC Pumps are available in sensorless (left) and sensor models to accommodate the needs of any size hydronic system



All the information for efficient pumping management.

And on the management front, Patterson CloudStat[®]-enabled HVAC pumps mark a true step forward. CloudStat Real-Time, Web-Based HVAC Pump Monitoring provides a browser-based, real-time view of pump status and efficiency from 500 ft or 50,000 miles. CloudStat is based on one-way cellular technology, installable without IT involvement, and there are no security risks. The system consists of a GSM modem installed in the control panel and an external antenna.

Cloud-hosted information includes:

- Cost in kW/gal of water pumped
- User-specified high and low alarm conditions: suction and discharge pressures, water volume pumped (with availability of volumetric rate signals)
- Trend lines: power cost for each pump, water consumption (with availability of flowmeter volumetric rate signals), operating pressures and total cost of operation

CloudStat allows compiling of important data for up to three years, aiding preventative maintenance. Alarms are communicated instantly by email or SMS text.



Operational Intelligence

Applications need to run at optimum efficiency for your success. Making informed decisions, easily, at a moment's notice is foundational to this. Embedded process knowledge provided by Patterson Intuition gives you the information you need.

Embedded Guidance

Avoid getting lost with start-up, integration of your drives and maintenance needs. New and intuitive built-in functions simplify support and diagnostics, allowing issues to be solved quickly and comprehensively.

Reliable and Sustainable

Long operating life and reliability have been the hallmarks of Patterson Pump Company and Schneider Electric for over 30 years. The tradition continues. We are ready to help you solve your challenges.



Operational Intelligence

> Custom Information

- Configurable Dashboard
- Graphical Keypad
- Pump Language

> Energy Management

- Motor Power Measurement
- Energy Dashboards
- Export Energy Data

> Embedded Ethernet and Web Server

- Local or Remote Access
- Achilles Level 2 Security
- Web server on any device using HTML5

> Process Monitoring & Control

- Operating Data Feedback
- Compare to Expected Values
- Predictive Maintenance
- Stop & Go
- Real time clock
- Sensor-less control (including multi-pump)
- Multi-Pump control (up to 6 pumps)

Reliable and Sustainable

- Digital Inputs
- Analog Inputs
- Relays
- Analog Outputs
- Conformal coating
- 50 degree C rating

Embedded Guidance

> Startup

- Pump specific functions
- Simply Start
- QR Code access to product information and technical support

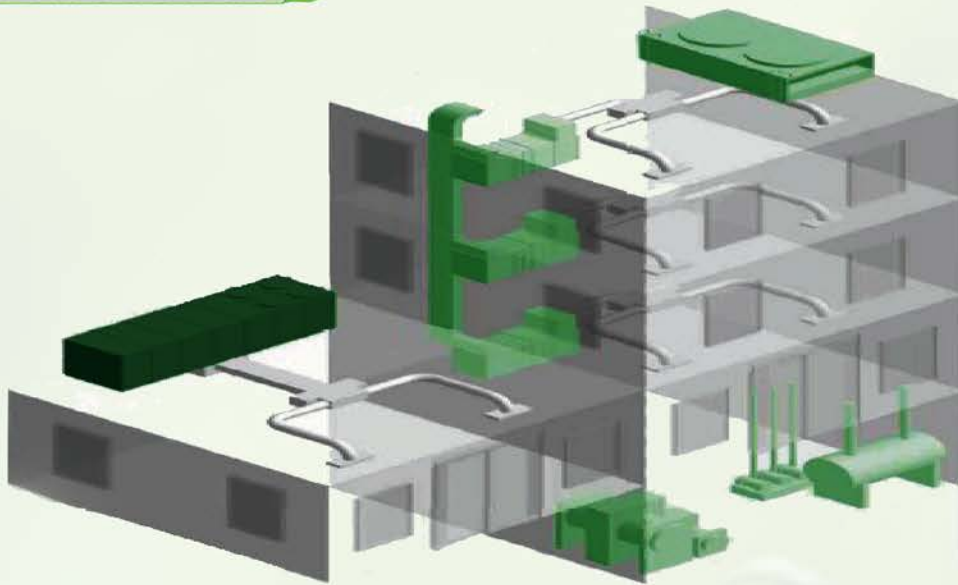
> Integration

- PlantStructure Optimized
- FDT / DTM Ready
- Industry Standard Communications

> Maintenance Excellence

- Dynamic QR code assistance
- Troubleshooting Messages
- Fast Device Replacement





Applications

- Booster Pumps
- Hot Water Pumps
- Chilled Water Pumps
- Condenser Water Pumps

Patterson intuition variable speed drives have over 30 functions dedicated for pumping applications.

Pump Functions

- Anti-Jam
- Flow Limitation
- Friction Loss Compensation (ASRAE 90.1-2010)
- Input Pump Curve Values
- Multi-Pump Control (Up to 6 Pumps)
- PID Monitoring Feedback
- PID Regulator
- Pipe Fill
- Pump Monitoring
- Pump Priming Control
- Sensorless Flow Estimation & Control
- Sleep / Wake Up

Voltage	Power Range	Standard Enclosure Offer
200 – 240 VAC	1 – 100 HP	Type 1: 1 – 100 HP Type 12: 1 – 60 HP Type 3R: 1 – 60 HP
400 – 480 VAC	1 – 900 HP	Type 1: 1 – 900 HP Type 12: 1 – 900 HP Type 3R: 1 – 125 HP

Pump Protection

- Dry Run
- High Flow
- Inlet/ Outlet Pressure
- Low Pressure
- No or Low Flow
- Process Overload Detection
- Process Under-load Detection
- Pump Cavitation
- Pump Cyclic Start



Options to Create the Right Solution

- Remote keypad mounting
- I/O extension cards
- Heatsink mounting kits
- Communication options: Ethernet IP/ Modbus TCP dual port, Profibus, ProfiNet, DeviceNet, CanOpen, Bacnet
- Incoming and outgoing power options

VFD Specifications

Drive Model:	Sensor Systems	Sensorless Systems
	ATV212	ATV Process
Voltage Ratings	3-Ø, 200–240 V 3-Ø, 380–480 V	1-Ø, (future) 3-Ø, 200–240 V 3-Ø, 380–480 V 3-Ø, 500–690 V
Horsepower Range	1–40 HP, 200 V/240 V 1–100 HP, 380 V/480 V	1–60 HP, 200 V/240 V 1–1000 HP, 380 V/480 V 2–1500 HP, 500 V/690 V
Enclosure Ratings	NEMA 1 (Std.) NEMA 12 (Opt. @ 480 V)	NEMA 1 (Std.) NEMA 12 (Opt.) NEMA 3R (Opt. <150hp)
Ambient Temperature Ratings, °C	40 (No Derate) Up to 60 (With Derate)	40 (No Derate) Up to 60 (With Derate)
Elevation Rating, Ft Above Sea Level	Up to 3300 (No Derate) 1% Derate For Each Additional 330 Ft Up To 6600 Ft	Up to 3300 (No Derate) 1% Derate For Each Additional 330 Ft Up To 15,800 Ft
Available Built In Disconnect	No	Yes
Communication (Integrated)	Modbus, Apogee P1, BACnet, Metasys® N2	Modbus Serial, Modbus TPC
Communication (Opt.)	LonWorks	Modbus TPC & Ethernet I/P dual port, CANopen, ProfiNet, Profibus DP V1, DeviceNet
Multi-Pump Control	No	Yes
Sensorless Control	No	Yes
Number of Functions	50	> 150
Number of I/Os		
Analog Inputs	2	3–5
Analog Outputs	1	2
Logic Inputs	3	6–12
Logic/Relay Outputs	2 — 1 N.O./N.C. & 1 N.O. Relay	2 DO, 2 STO, 3 — 6 N.O./N.C. Relay



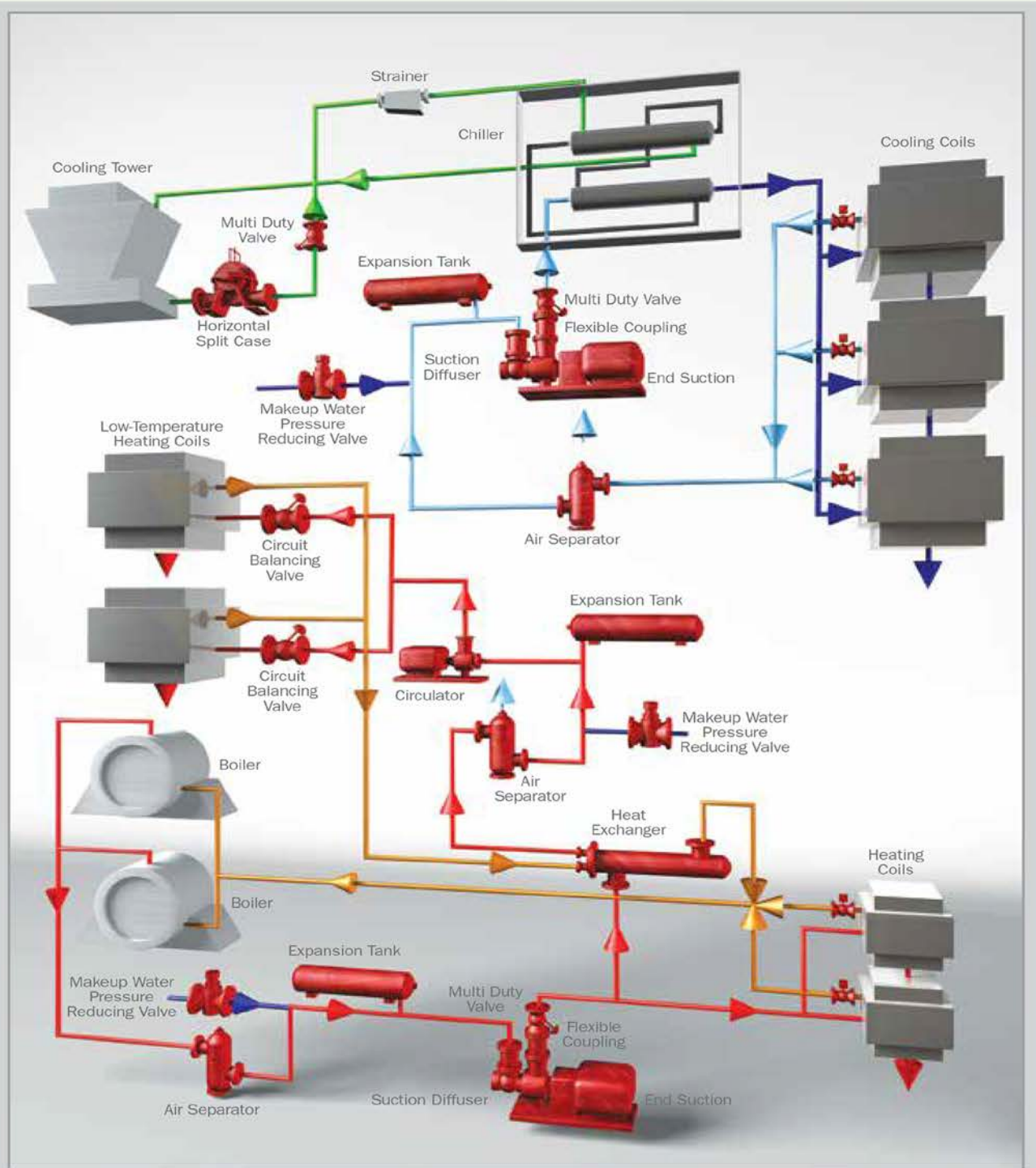
ATV Process display with embedded dynamic QR codes for contextual, instantaneous access to online help using a smartphone or tablet.

ATV Process terminal showing dynamic pump operation in relation to its optimum operation.



HVAC EnviroFlo Solutions

Patterson has the engineering expertise, high-efficiency pumps, engineered products and accessories to provide sustainable, energy efficient HVAC solutions to multiple story and large complex commercial, residential and industrial applications.



The Pump People®

EnviroFlo™ Engineered Products



Circulators

Benefits

- Engineered for dependability, ease of service and quiet operation
- Easy interchangeability—flange-to-flange dimensions equal those of most competing pumps

Features

- Available in both cast iron and all-bronze bodies
- EPDM mechanical seal and casing O-ring-Optional: Buna-N
- Standard split-phase motor, UL and CSA listed, ODP with thermal protection
- Rated to 125 psi and 250° F
- Enclosed impellers
- Up to 150 gpm and up to 55 ft tdh

Patterson E-Circ Inline Circulator

Pumps are designed for continuous duty industrial/commercial systems. The pumps are multipurpose in-line pumps that offer wide performance handling. The ECM motors are speed adjustable which allows the matching of flow and head requirements while reducing power consumption. Pumps are dimensionally interchangeable with other manufacturers. Proper installation for pump, motor and pipe support by a qualified professional is required for all models.

*Maximum temperature applies to water only.

- Cast Iron Construction with 300 Series Stainless Steel Impeller
- EPDM/EPR Mechanical Seal, Casing O-Ring & Gaskets
- 1" - 3" Suction & Discharge Ports Depending on Model Selected
- Maximum Working Pressure 150 PSI
- Maximum Temperature 225°F (107°C)*
- Maximum Flow 190 GPM
- Maximum Head 38 Ft. (16.5 PSI)



Suction Diffusers

Benefits

- Establish correct flow regimen for efficient pump suction conditions
- Simplify system design by combining the functions of the suction entrance pipe, long radius elbow, Y-strainer and start-up strainer
- Low pressure drop—thanks to inlet flange designed to allow a butterfly valve to fully open into the body of the suction diffuser
- Body is designed to use bolts—no threaded studs required
- Corrugated stainless steel permanent strainer provides maximum surface area

Features

- Available in full and reducing sizes, 2 in. – 12 in.
- Standard with magnetic plug
- Fine mesh brass start-up strainer
- Support foot
- Rated to 175 psi, 250° F

Dirt and Air Separators

Benefits

- Ensures quiet, controlled heating and cooling by removing entrained air from recirculating hot and chilled water

Features

- ASME code stamped, 175 psi
- Vortex design
- Available in 2 in. – 12 in. sizes (in stock)
- Sizes larger than 12 in. are also available
- Available with or without integral stainless steel strainer

Plate & Frame Heat Exchangers

Benefits

- Embossed plates promote high turbulence at low fluid velocities, for very high heat transfer coefficients and reduced fouling
- High thermal efficiency and high surface density requires 1/5 – 1/2 of the floor space of equivalent duty heat transfer equipment
- It is possible to heat or cool two or more fluids within the unit by simply installing divider sections between the plates

Features

- True counterflow of fluids, reducing amount of transfer surface required
- Lightweight construction
- Adjust unit's thermal performance by adding or removing plates

EnviroFlo™ Accessories



Flexible Connectors

Standard neoprene or nylon connectors (other materials available) reduce noise and vibration. Rated to 214 psi at temperatures up to 240° F. Solid plate steel flanges provide a fluid tight connection. Stainless steel flexible connectors also available.

Makeup Water Pressure Reducing Valves Tight seating check valve with integral strainer and unitized design for simplified servicing. Set at 15 psi. Sizes 1/2 in. and 3/4 in. Rated for 100 psi and 212° F.



Plug

Multipurpose Valves Globe and Plug Style

- Combination valve replaces the features of a check valve, balancing valve and shutoff valve
- Available in 2 in. – 12 in. sizes
- Cast iron body with ANSI flanged connections
- Working pressure is 175 psi at 250° F
- Metering ports
- Optional meter gauge



Globe

Other Engineered Products

Additional products available include air purgers, expansion tanks, circuit balancing valves and shell & tube heat exchangers.

Automatic Vent Valves

Float-actuated, automatic air venting through top-mounted purge valve. Under system pressure, the valve plug seals and prevents water flow. Also serves as a vacuum break. Available in sizes 1/8 in. – 1 in. NPTF.

Other Specialty Products

Also available are vertical multi-stage pumps, glycol makeup units, tank drainers, tank air control fittings and related specialties.

The Pump People®

Full Service Resources

Testing, training and personalized service...
all from Patterson.

Patterson's commitment to sustainable HVAC applications around the world goes beyond our extensive line of quality EnviroFlo pumps, engineered products and accessories.

Our highly engineered pumps are thoroughly tested, including hydrostatic pressure-testing, in our fully equipped laboratory. This enables our engineers to verify design and performance specifications of our pumps and ensures reliable service for you year after year.

Also, we are one of the few worldwide pump manufacturers who offer coordinated training in the proper operation and maintenance of our pumping products. Engineering and maintenance personnel from around the globe benefit from this training at our dedicated facility in Toccoa, Georgia, U.S.A. And our teams of field and factory experts always stand ready to provide our customers with dedicated personal service, whether it's a complete pump rebuild, a single O.E.M. part or the answer to a simple question.

You can count on our EnviroFlo pump technology experts to help you identify and secure everything you need for a highperformance, efficient HVAC installation. Your comfort in working with us is as important as the interior comfort our products power for your installations.



Pumping Technology for Tomorrow's World

Over the last century, Patterson built a firm reputation for reliable pump installation worldwide

Patterson Pump Company leads America as one of the foremost designers and manufacturers of: Split Case Pumps; Fire Pumps; Axial and Mixed Flow Pumps; Vertical Turbine Pumps; End Suction Pumps; Vertical In-Line Pumps; solids handling pumps; engineered packaged systems; HVAC and Booster Systems.

Proven Quality and Reliability for More Than a Century. It is Patterson's century-long dedication to the quality, innovation and reliability of its products that has inspired its high-quality, valued employees.

Patterson's design engineers are driven to continuously make incremental improvements throughout the company's product line and to develop leading-edge pumping technology.

Just as Patterson's highly trained machinists meticulously operate the cutting-edge, computer-controlled machining centers, vertical turning centers and computerized lathes—all to create Patterson products with high-precision workmanship in less time for faster delivery.

The quality and reliability of Patterson products doesn't stop at installation. Patterson is equally dedicated to providing the finest field and factory services and maintaining the best service department in the industry.

ISO 14001 Certification. Patterson does more than strive for quality and reliability; Patterson has invested in the company's core values.

Attesting to its world-class quality and dependability. The company is continually reevaluated, with a complete reassessment every three years, to ensure all elements are maintained in keeping its products world-class.

Six Sigma. Patterson has also invested significant resources into its Six Sigma program. Six Sigma is an optimized level of performance. That's overall excellence—not only in a world-class finished product, but also in the administrative, service and manufacturing processes throughout the company.

Patterson's Six Sigma program is a proven methodology that standardizes the right tools and techniques, while providing working teams with step-wise progressions in applying these tools. The program has successfully enhanced Patterson's reputation for high-quality, reliable pump design, manufacture and service.



The Pump People®



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