

PumpControl-PF

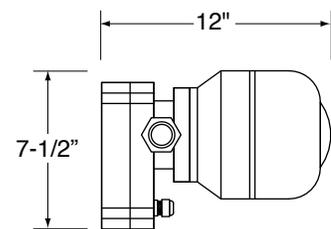
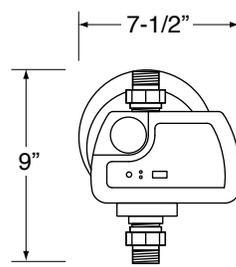
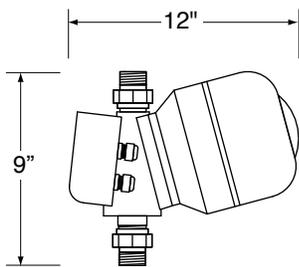
The PumpControl-PF is a state-of-the-art pump control system that installs in line between the pump and water use to monitor and control water flow and electrical power. It replaces a pressure tank and pressure switch, automatically starting and stopping a pump based on water demand. It also replaces low-water floats, pump power protectors, and pressure gauges, providing sophisticated dry-run and overload protection by continuously monitoring the flow, pressure, current, and power factor.

A digital display shows the instantaneous pressure, current, and power factor, and is also used to set pump operating parameters. An integral 3-quart pressure tank minimizes destructive pump cycling from leaks. Other features include 1" or 1-1/4" nickel-plated brass unions, pre-installed power cables (120v/60hz only), encapsulated circuit boards, and weather-resistant construction (IP65), and optimized hydraulics for very low pressure loss.

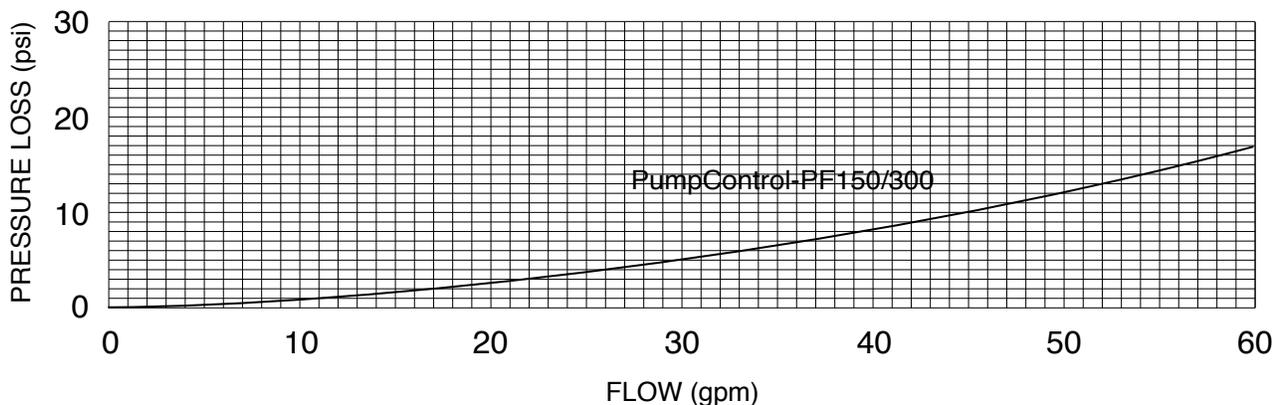


PHYSICAL AND ELECTRICAL CHARACTERISTICS

Model	Power	Voltage	Current	Pressure	Inlet/Outlet
PumpControl-PF150	1-1/2 hp	110-120v/50-60hz/1 ϕ	16 a	115 psi	1" or 1-1/4" mpt unions
PumpControl-PF300	3 hp	110-120v/50-60hz/1 ϕ	16 a	115 psi	1" or 1-1/4" mpt unions



HYDRAULIC CHARACTERISTICS



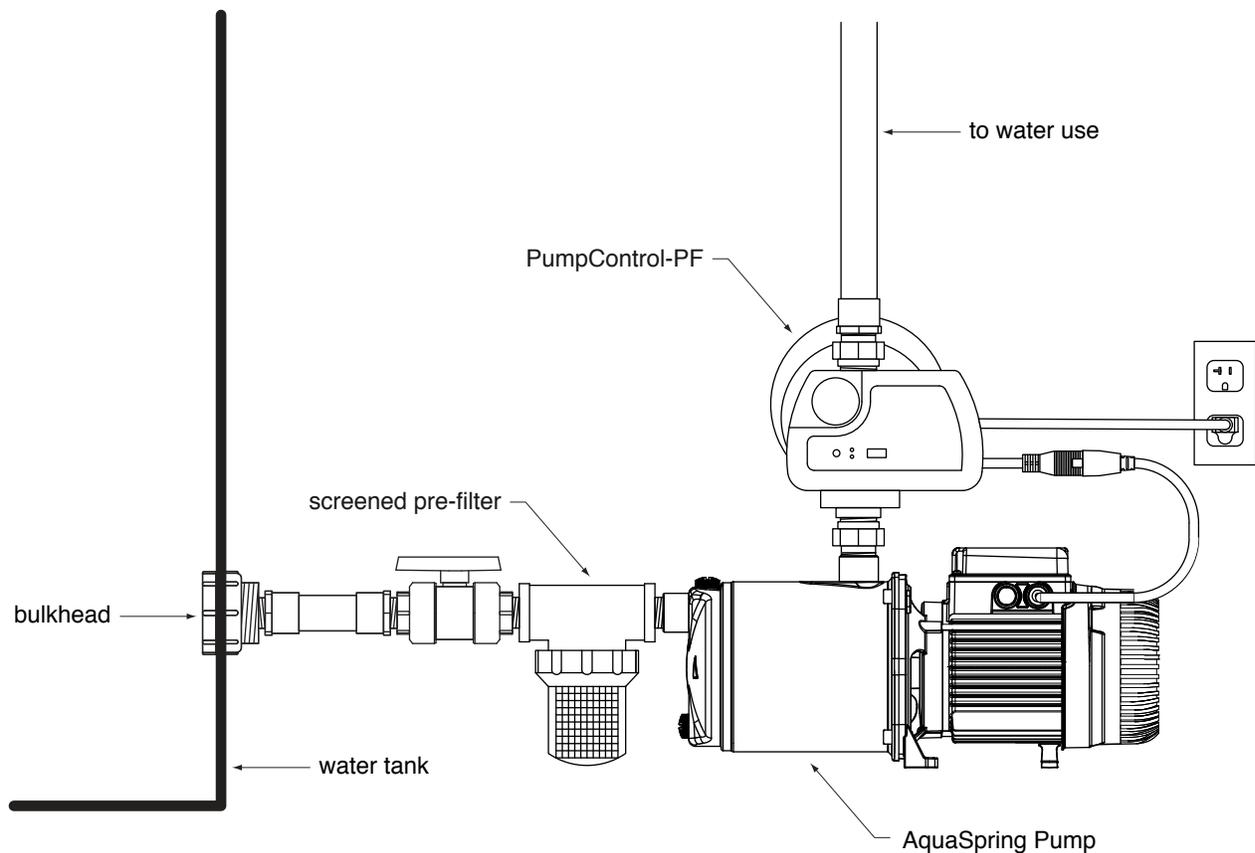
INSTALLATION WITH SURFACE PUMPS

The PumpControl-PF can be used with any 120v or 240v single phase manual surface pump that draws less than 16a maximum running current and produces less than 115psi maximum pressure. Although it is weather resistant, it is not waterproof and should always be installed in a sheltered location above ground. Typically it is mounted directly on top of the pump, but it can also be mounted remotely if the connecting pipes are properly supported. Water flows from the pump to the pump controller, and then to the water use.

Electricity is supplied from the power source to the pump controller, and then to the pump. This allows the pump controller to monitor water flowing from the pump and power flowing to the pump without any sensors or control wiring. The 120v version includes a power cable with a male plug to connect to any wall receptacle, as well as a short cable with a female plug to accept the pump power cable. It is also supplied with integral brass unions to connect to the pump and outlet pipe. The 240v version is also supplied with integral brass unions and electrical cables, but the cables are not supplied with plugs and should be hard wired.

Note that the PumpControl-PF does not control water pressure, so when the pump is running it may deliver its maximum rated flow at the particular head loss of the plumbing system. If this pressure is too high for connected fixtures, a pressure reducing valve should be installed on the outlet side of the controller. Alternately, the PumpControl-PF used in conjunction with a surface pump can serve as a superb booster pump system to solve problems with low water pressure.

Complete pumping system consisting
of AquaSpring surface pump and
PumpControl-PF controller.



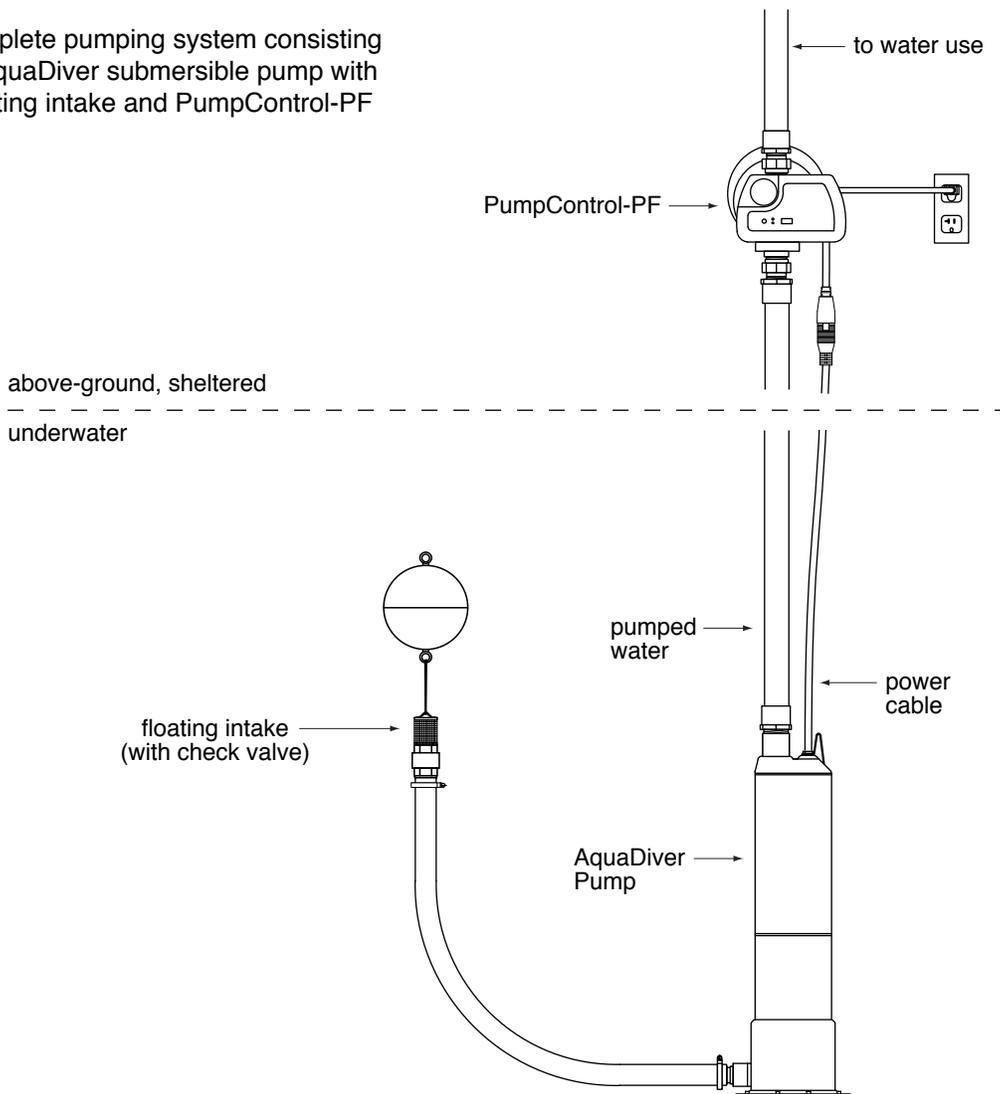
INSTALLATION WITH SUBMERSIBLE PUMPS

The PumpControl-PF can be used with any 120v or 240v single phase manual submersible pump that draws less than 16a maximum running current and produces less than 115psi maximum pressure. Although it is weather resistant, it is not waterproof and should always be installed in a sheltered location above ground. Typically it is mounted in a mechanical room, shed, or shelter and is supported by the connecting piping.

Water flows from the pump to the pump controller, and then to the water use. Electricity is supplied from the power source to the pump controller, and then to the pump. This allows the pump controller to monitor water flowing from the pump and power flowing to the pump without any sensors or control wiring. The 120v version includes a power cable with a male plug to connect to any wall receptacle, as well as a short cable with a female plug to accept the pump power cable. It is also supplied with integral brass unions to connect to the pump and outlet pipe. The 240v version is also supplied with integral brass unions and electrical cables, but the cables are not supplied with plugs and should be hard wired.

Note that the PumpControl-PF does not control water pressure, so when the pump is running it may deliver its maximum rated flow at the particular head loss of the plumbing system. If this pressure is too high for connected fixtures, a pressure reducing valve should be installed on the outlet side of the controller.

Complete pumping system consisting of AquaDiver submersible pump with floating intake and PumpControl-PF



OPERATING PARAMETERS

All of the following PumpControl-PF operating parameters can be easily set or changed using a single pushbutton with a procedure that is so simple it is printed on the controller label:

MP is the *minimum pressure*, the pressure at which the controller will start the pump in order to restore system pressure. With traditional pump systems, this function would be provided by a factory-set mechanical switch in a pressure tank and would require a pressure gauge for monitoring and periodic adjustment. With the PumpControl-PF the pressure can be set digitally to any value between 15 psi and 70 psi and the cut-in pressure can be monitored simply by watching the display screen.

MA is the *maximum amps*, the current at which the controller will disconnect power to the pump for protection. While this function can be provided by supplemental pump overcurrent devices, to work properly it is essential to know the true pump current and data provided by pump manufacturers is often inaccurate. The PumpControl-PF displays the normal pump running current, allowing the user to set the optimal overcurrent protection point a few amperes higher. (any value between 1a and 16a). Changes in operating current due to voltage fluctuations can also be observed.

MF is the *minimum power factor*, the power factor at which the controller will disconnect power to the pump for protection. The power factor is an electrical characteristic of pumps ranging from 0.01 to 0.99 that indicates the relationship between applied and delivered power. Since the power factor changes instantly when a pump runs dry, by monitoring the power factor it is possible to detect dry-running long before it can be confirmed by monitoring pressure and flow. In the case of submersible pumps, the faster response time can make the difference between protecting or destroying bearings. Even though power factor protection is rarely found even in expensive commercial pump control devices, the PumpControl-PF not only provides this protection but it also measures and displays the power factor when the pump is running normally. The user can then set the optimal power factor level approximately 10 units lower (any value between 1 and 99, corresponding to power factors from 0.01 to 0.99).

TP is the *time to prime*, the time delay in seconds between the time the controller applies power to the pump and the time the controller detects adequate water pressure or flow rate. The priming process occurs when the pump is first started or when it is re-started after dry-running (see parameter TR below) and can be set from 1 second to 99 seconds.

TD is the *time to dry run*, the time delay in seconds between the time the controller detects dry running, either by detecting a low power factor or by detecting insufficient flow and pressure. This delay be set from 1 second to 99 seconds.

TR is the *time to restart*, the time delay in hours after the controller shuts down the pump for dry-run protection until it attempts to re-prime the pump. This can be set from 1 hour to 99 hours and will repeat indefinitely until the pump successfully primes. For pumping systems where water is normally available, such as for pressure boosting applications, this delay is normally set to 1 hour; for rainwater harvesting systems where dry-running likely results from an empty cistern, the delay is normally set to at least 24 hours. Since the PumpControl-PF monitors the power factor and can shut down dry pumps in seconds, even sensitive submersible pumps can safely be re-started.

DIAGNOSTICS AND MAINTENANCE

The transparent, user-friendly operation of the PumpControl-PF makes it easy to identify and solve pump system problems. During normal operation the display shows **P**, the running Pressure in psi; pressing the pushbutton shows **A**, the running current in Amperes; and pressing the pushbutton a second time shows **F**, the power Factor. By noting normal parameters when the system is started, it becomes immediately obvious when pump characteristics are not normal. Clear error messages **DRY RUN**, **NO PRIME**, **LEAK**, and **OVERLOAD** diagnose conditions that have caused the controller to shut off the pump.

In the rare event of more serious problems, the controller is fully field serviceable. All of the key components, the circuit board, the check valve, and the pressure tank can be easily replaced without removing the controller, and with built-in unions and plug-in cables (120v), even replacing the entire controller takes only minutes.