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## Answers

How do I size the **Aquavar SOLO<sup>2</sup>** for the appropriate pump/motor combination?

The **Aquavar SOLO<sup>2</sup>** can accept any 3 phase, 230 volt 4" submersible motor up to its rated amperage.

The **Aquavar SOLO<sup>2</sup>** has an adjustable overload switch to dial in the correct full load or service factor amperage.

Can I use a 208 Volt motor?

Yes, The **Aquavar SOLO<sup>2</sup>** monitors amperage draw from the motor and as long as it is within the current rating set on the overload switch. Ensure the input voltage is within  $\leq 196V$  and  $< 265V$ . The user may see a drop in performance if the SFA setting is less than the motor's SFA rating.

Can I run the **Aquavar SOLO<sup>2</sup>** up to 80HZ?

Yes, as long as the rated amperage for the motor at 80HZ does not exceed the overload switch setting or max amps of the drive. Switch the setting on the controller to 80HZ max speed. Example: If you have a 1.5HP submersible wet end and use a 3HP motor, then size a 3HP **Aquavar SOLO<sup>2</sup>** (3AS30) which is rated for 10.9 max amps, which is equal to 1.5HP hydraulic performance.

What are the recommended spare parts for an **Aquavar SOLO<sup>2</sup>**? Can I repair?

The pressure transducer (sensor) is recommended to keep on hand for repair. In addition the UIB, Fan kit and transducer cable are also replaceable.

Can I mount the **Aquavar SOLO<sup>2</sup>** controller in an outside environment? If so what are the maximum conditions allowed?

The **Aquavar SOLO<sup>2</sup>** series is rated UL type 3R enclosure, outdoor or rain-tight and can accept ambient conditions up to 122 degrees F. If the controller gets too hot it will reduce speed to cool off and this will affect pump performance. Caution is advised for humid and poor air quality environments.

What if my **Aquavar SOLO<sup>2</sup>** controller is not putting out the recommended output in GPM?

Check rotation of the motor, verify ambient conditions, check motor wire and splices and finally check the pump for clogging or valve operation. Verify SFA setting matches the motor's SFA rating. Additionally lower input voltage can reduce pump performance.

Why does my pressure drop suddenly during start up?

A properly sized air diaphragm tank and pre-charge (see IOM) is necessary during rapid use of water at start up. Look at the pump depth, static levels and maximum system demand (GPM) to determine how much time is necessary for the water to reach the transducer placement. Remember, the **Aquavar SOLO<sup>2</sup>** controller is a soft-start and will take a few seconds to respond depending upon the distance between the pump discharge and transducer placement.

What about interference with AM radio or other devices?

The **Aquavar SOLO<sup>2</sup>** controller has several design features that reduce the unwanted electromagnetic interference (EMI) sometimes contributed to VFD acceptance. Levels are established by the FCC for residential and commercial installations. It is suggested to always keep **Aquavar SOLO<sup>2</sup>** power and motor leads away from sensitive devices and ensure proper grounding for all components of the **Aquavar SOLO<sup>2</sup>** system including motor, piping, breaker and main panel.

Is the unit sensitive to lightning strikes or voltage disturbances?

Yes. Nothing can prevent direct hits from lightning, however, the **Aquavar SOLO<sup>2</sup>** does use surge arrestors to prevent damage of indirect strikes and intermittent voltage fluctuations. These protective devices are the same as used in expensive residential surge arrestors for computers and electronic protection. For additional protection we recommend an external surge and lightning protection.

Can I use the **Aquavar SOLO<sup>2</sup>** with generators?

Yes, properly sized and equipped generators can be used. See IM229 for sizing and requirements.

Can I use GFCI protected power for the **Aquavar SOLO<sup>2</sup>** controller?

No, like most VFD's there is a higher leakage current to ground that will cause nuisance tripping. It is designed for equipment protection on short circuit.

Is my pressure transducer sensitive to stray voltage and electrical disturbances?

Yes. The **Aquavar SOLO<sup>2</sup>** provided pressure transducer also has electrical surge protection built into the electronics. It is still recommended to ground the metal piping and sensor casing for plastic pipe to ensure the transducer is bonded to the same ground point as the incoming power and submersible motor.

What type of breakers or fuses should I use?

Fast acting or quick trip type to ensure proper short circuit protection of the drive electronics. Class T fuses or UL 498 / UL98 rated breakers. Breaker must not have a time delay.

Can I use aluminum wire (pre-existing or new installation)?

No. Due to the differences in resistance and other properties, it is NOT recommended using aluminum wire (even if oversized) with the **Aquavar SOLO<sup>2</sup>**.

Will the **Aquavar SOLO<sup>2</sup>** increase the life of my pump and motor compared to a conventional switch system?

All things being equal the **Aquavar SOLO<sup>2</sup>** reduces the initial start up thrust, and water hammer associated with conventional systems. Soft-start, soft shut down, reduced in-rush current, reduced wear on mechanical components of the pump and motor will help extend life. Proper installation and well conditions still remains the key to pump system longevity.

Is the pressure transducer operation sensitive to poor signal and electrical disturbances?

Rule of thumb is to not coil excess transducer cable. Coiling the excess cable can lead to stray voltage/electrical disturbances that can affect the transducer's ability to correctly read the pressure. Cut excess transducer wire once correct length is determined and run transducer wire through its own separate conduit whenever possible.

Can submersible cable (copper 75°) be used to extend the length of transducer?

Yes, Single and double jacketed, single stranded wire is acceptable; please refer to local code requirements.

When sizing the **Aquavar SOLO<sup>2</sup>** for use with another motor manufacturer, is it recommended to upsize to the next size **Aquavar SOLO<sup>2</sup>**, to maximize the performance of the pump?

The **Aquavar SOLO<sup>2</sup>** is rated for use with most submersible motors for their given horsepower rating. Please compare the service factor amps (SFA) on the motor to the maximum output on the drive. If the motor SFA value is higher than the capacity on the drive than the drive may limit the speed of the motor, which will lower the output performance of the pump. The amperage data can be found in the **Aquavar SOLO<sup>2</sup>** bulletin.

Can the **Aquavar SOLO<sup>2</sup>** run without the pressure transducer/or if there is a transducer failure?

Yes, You can bypass or "jump" the transducer by placing a jumper from the lower terminals to the upper terminals. The jumper is located to the right of the transducer connections on the inside of the drive. Refer to IM229 for specific details.

What accessories are offered for use with the **Aquavar SOLO<sup>2</sup>**?

The ability to install a float switch, an overpressure switch, or a moisture sensor. These would be installed in place of the jumper on the switch input. Please reference the Instruction manual for details.

Are 80Hz performance curves available?

Many 30-80Hz curves and selection charts are published within the 30-80Hz **ProPak** Bulletin.

Can I use a float switch instead of a pressure transducer with the **Aquavar SOLO<sup>2</sup>**?

Yes. The **Aquavar SOLO<sup>2</sup>** has a switch input for float, pressure, or other non-powered switches. Refer to IM229 for specific details.

How far can the float switch be from the drive? What is the maximum total length for pressure transducer cable?

The maximum distance of float switch and pressure transducer cable is 200 feet.

Is the pressure transducer affected by a vacuum, or by water hammer?

Yes the transducer can be affected by a vacuum. It is not designed to be exposed to negative pressure and damage to the diaphragm inside the transducer can result. It can also be damaged by repetitive water hammer. If you suspect either condition, a gauge guard (6K210) may dampen the effects and protect the transducer. In addition a vacuum on the transducer of more than 17" Hg will cause the drive to fault out on a 3 blink alarm - sensor fault. In addition the pressure transducer requires protection from freezing.

What causes a pressure fluctuation of more than 5 PSI (assuming the controller is set at 5PSI not 20)?

Pressure fluctuations are the result of changes in demand. So a rapid drop of more than 5 psi could simply be from opening a valve quickly. It could also be from a rupture in the diaphragm tank or a poorly working check valve.

What is the proper orientation and location for the pressure transducer?

Pressure transducer should be placed close to the tank in the vertical or horizontal orientation. Do not install the pressure transducer with the pressure port facing up to avoid filling the port with debris. Do not install any valves (except for a check valve) between the pressure transducer and the pump.

How can the **Aquavar SOLO<sup>2</sup>** be used to develop a well system?

Set the low pressure cutoff function to off to avoid tripping on low pressure. Use this function for open discharge situations or whenever the system pressure will be 20PSI or more below the system set point pressure. The low pressure cutoff function must be returned to the on position after system set up is complete.

Can the **Aquavar SOLO<sup>2</sup>** be used for surface mount booster applications? What are the motor electrical requirements?

Yes, however we do supply the **Aquavar ABII** or **S Drive** for this application. The surface mount motor does not typically require the filter that is used with submersible motors. That is why the **Aquavar ABII** and **S Drive** are more appropriate for surface mount applications than the **Aquavar SOLO<sup>2</sup>**.

**Can I run a 50Hz motor with the Aquavar SOLO<sup>2</sup> or use the Aquavar SOLO<sup>2</sup> in a 50Hz application?**

The Aquavar SOLO can be used in a 50Hz application, 50Hz input in combination with lower input voltage than 230V will likely reduce hydraulic performance in order to compensate for higher running current load. This is similar to system response in “dirty voltage” conditions.

**Can I use a 208V input on the Aquavar SOLO<sup>2</sup>?**

Yes, the input power used must be a grounded power system. The voltage measured from L1 and L2 must be in the range of 196VAC to 265VAC. The voltage measured from L1 to GND and L2 to GND must be equal and within a range of 120VAC  $\pm$ 10%. Reduced input voltage will reduce system performance.

**Why would I use Dual Set points and how do I set it up?**

Dual set points are used in an application where a different set point value is required for a portion of the day such as night set back or irrigation system. Please reference IM229 for set up.

**How do I program output relays?**

To configure the output relay parameter first press and hold the mode button for 10 seconds, this will allow you to scroll through the menu structure. Press the down button 5 times until you reach “rCon”. Press the mode button for 2 seconds to enter the parameter list. Use the down button to select the parameter, choose from RUN, Fault and Not Fault. Once parameter is selected, press MODE button and wait for parameter to blink to confirm it was saved. Please reference IM229 for additional set up

**How do I reset fault history?**

To reset the fault history first press and hold the mode button for 10 seconds, this will allow you to scroll through the menu structure. Press the down button 3 times until you reach “FrSt” (Fault code history reset). Press and hold the mode button for 2 seconds to reset. Display will read done when reset is complete.

**Can the Aquavar SOLO<sup>2</sup> run a chlorinator or another external metering pump?**

Yes, however the external pump requires its own power source. The Aquavar SOLO<sup>2</sup> can provide an output signal to control the metering pump. Please reference IM229 for additional set up.