

INSTRUCTION MANUAL

IM156



MODELS COVERED:

1151AB2 (115V, 4.2A), 1AB2 (230V, 4.2A),
2AB2 (230V, 6.9A)

Aquavar ABII Controller

VARIABLE SPEED PUMP CONTROL

INSTALLATION, OPERATION AND TROUBLESHOOTING MANUAL



Owner's Information

Controller Model Number: _____
Controller Serial Number: _____
Pump Model Number: _____
Pump Serial Number: _____
Motor Model Number: _____
Motor SFA: _____
Tank Serial Number: _____
Installer: _____

Installer Telephone Number: _____
Installation Date: _____
Wire Lengths (Feet)
Service Entrance to Controller: _____
Controller to Motor: _____
Incoming Voltage: _____

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NOTICE: RECORD THE MODEL NUMBERS AND SERIAL NUMBERS FROM THE PUMP AND CONTROLLER IN THIS INSTRUCTION MANUAL FOR FUTURE REFERENCE. GIVE IT TO THE OWNER OR AFFIX IT TO THE CONTROLLER WHEN FINISHED WITH THE INSTALLATION.

NOTE:

- Use Copper wire only.
- Suitable for use on a circuit capable of delivering not more than 5000 RMS symmetrical amperes. Branch circuit protection provided by fuses.
- Suitable for use in a pollution degree 2 micro-environment.
- Motor overload protection provided at 110% of full load current.
- In order to maintain the environmental rating integrity of the enclosure, all openings must be closed by equipment rated 3, 3R, 3S, 4, 4X, 6 or 6P.
- Maximum ambient temperature is 50° C.

1: SAFETY INSTRUCTIONS

TO AVOID SERIOUS OR FATAL PERSONAL INJURY OR MAJOR PROPERTY DAMAGE, READ AND FOLLOW ALL SAFETY INSTRUCTIONS IN MANUAL AND ON EQUIPMENT.

THIS MANUAL IS INTENDED TO ASSIST IN THE INSTALLATION AND OPERATION OF THIS UNIT AND MUST BE KEPT WITH THE UNIT.



This is a **SAFETY ALERT SYMBOL**. When you see this symbol on the pump, the controller or in the manual, look for one of the following signal words and be alert to the potential for personal injury or property damage.



Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.




Used without a safety alert symbol indicates a potentially hazardous situation which, if not avoided, could result in property damage.

NOTE: INDICATES SPECIAL INSTRUCTIONS WHICH ARE VERY IMPORTANT AND MUST BE FOLLOWED.


THOROUGHLY REVIEW ALL INSTRUCTIONS AND WARNINGS PRIOR TO PERFORMING ANY WORK ON THIS CONTROLLER.

MAINTAIN ALL SAFETY DECALS.

ALL OPERATING INSTRUCTIONS MUST BE READ, UNDERSTOOD, AND FOLLOWED BY THE OPERATING PERSONNEL. GOULDS WATER TECHNOLOGY ACCEPTS NO LIABILITY FOR DAMAGES OR OPERATING DISORDERS WHICH ARE THE RESULT OF NON-COMPLIANCE WITH THE OPERATING INSTRUCTIONS.

1. This manual is intended to assist in the installation, operation and repair of the system and must be kept with the system.
2. Installation and maintenance **MUST** be performed by properly trained and qualified personnel.
3. Review all instructions and warnings prior to performing any work on the system.
4. Any safety decals **MUST** be left on the controller and pump.
5.  **Hazardous voltage** The system **MUST** be disconnected from the main power supply before attempting any operation or maintenance on the

electrical or mechanical part of the system. Failure to disconnect electrical power before attempting any operation or maintenance can result in electrical shock, burns or death.

6.  **Hazardous Pressure** When in operation, the motor and pump could start unexpectedly and cause serious injury.

2: SYSTEM COMPONENTS

Please review the Aquavar ABII components and insure that you have all the parts and are familiar with their names. Be sure to inspect all components Goulds Water Technology supplies for shipping damage.

Aquavar ABII:

1. Pump with Motor
2. Aquavar ABII Controller with Integral Pressure Sensor Cable
3. Pressure Tank (supplied on some models)
4. Pressure Sensor
5. Mounting Kit
6. Tank Tee with Pipe Plug
7. Pressure Gauge

WARNING



DO NOT power the unit or run the pump until all electrical and plumbing connections, especially the pressure sensor connection, are completed. The pump should not be run dry. All electrical work must be performed by a qualified technician. Always follow the National



Electrical Code (NEC), or the Canadian Electrical Code (CEC) as well as all local, state and provincial codes. Code questions should be directed to your local electrical inspector. Failure to follow electrical codes and OSHA safety standards may result in personal injury or equipment damage. Failure to follow manufacturer's installation instructions may result in electrical shock, fire hazard, personal injury, death, damage to equipment, unsatisfactory performance and may void manufacturer's warranty.

3: SYSTEM DESIGN

NOTE: Systems MUST be designed by qualified technicians only and meet all applicable state and local code requirements.

The following diagrams show a typical system using the Aquavar ABII Constant Pressure System. Connection can be made directly to a water supply or water can be drawn from a supply tank. Diagram #1 shows a typical set up for a supply tank.

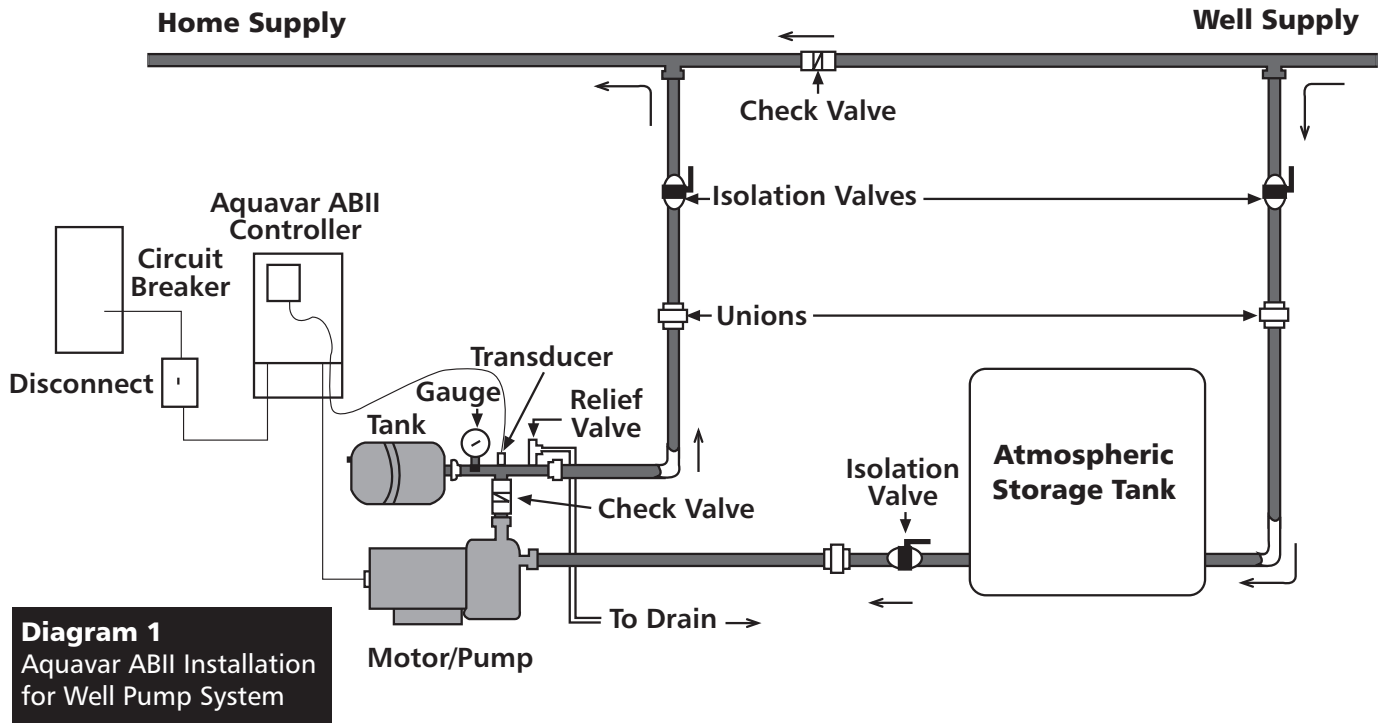
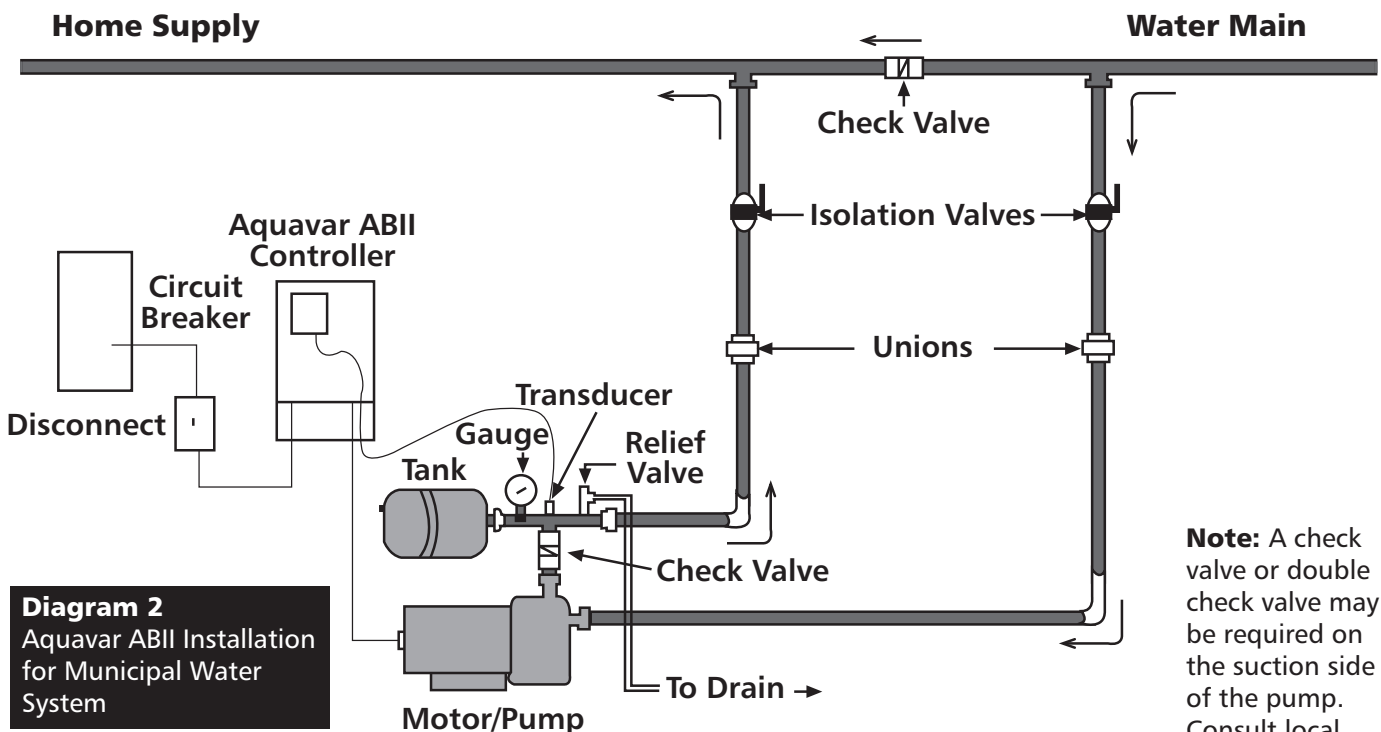


Diagram #2 shows a set-up for municipal water connection. This allows pump maintenance without main line shut-off.



Note: A check valve or double check valve may be required on the suction side of the pump. Consult local codes.

4: PIPING

General

NOTE: All plumbing work must be performed by a qualified technician. Always follow all local, state and provincial codes.

A proper installation requires a pressure relief valve, a 1/4" female N.P.T. threaded fitting (found on tank tee) for the pressure sensor, and properly sized pipe. Piping should be no smaller than the pump discharge and/or suction connections. Piping should be kept as short as possible. Avoid the use of unnecessary fittings to minimize friction losses.

CAUTION Hazardous Pressure Some pump and motor combinations supplied with this system can create over 200 PSI. Select pipe and fittings accordingly per your pipe suppliers' recommendation. Consult local codes for piping requirements in your area.

All joints must be airtight. Use Teflon tape or another type of pipe sealant to seal threaded connections. Please be careful when using thread sealant as any excess that gets inside the pipe may plug the pressure sensor.

Galvanized fittings or pipe should never be connected directly to the stainless steel discharge head or casing as galvanic corrosion may occur. Barb type connectors should always be double clamped.

Pressure Tank, Pressure Relief Valve and Discharge Piping

The standard Hydro-Pro tanks have a pre-charge of 38 PSI. You may set the tank pre-charge anywhere between this value and 10 PSI below the system operating pressure. Use the higher tank pre-charge setting if the system drifts over 5 PSI at a constant flow rate. Use only "pre-charged" tanks on this system. Do not use galvanized tanks. Select an area that is always above 34° F (1.1° C) in which to install the tank and pressure relief valve. If this is an area where a water leak or pressure relief valve blow-off may damage property, connect a drain line to the pressure relief valve. Run the drain line from the pressure relief valve to a suitable drain or to an area where water will not damage property. Use the supplied tank tee to connect the discharge pipe to the pressure tank and house plumbing. It is allowable to pump to multiple locations.

WARNING Maximum working pressure of most HydroPro tanks is 125 psi. Check the tank label or instruction manual to verify data.

Installing the Pump

WARNING Hazardous voltage **CAUTION** Hazardous Pressure **WARNING:** Risk of electric shock - This pump system has not been investigated for use in swimming pool areas.

CAUTION Hazardous Pressure Plumb suction and discharge of pump into piping. Locate the pump as near liquid

source as possible. When pumping out of an atmospheric tank locate the pump below the level of the liquid in the tank. All piping must be supported independently of the pump. Be sure that suction and discharge piping are in line with the suction and discharge of the pump. Install a check valve between the discharge of the pump and the pressure sensor and tank. For additional information refer to Installation, Operation and Maintenance Instructions supplied with the pump.

Installing the Pressure Sensor

Install the pressure sensor in the tank tee provided with the unit. The pressure sensor cable supplied with the controller is 120 inches long. Locate the controller so there will be enough cable to properly install the pressure sensor.

CAUTION Hazardous Pressure Do not install any shut-off valves, filters or flow/pressure control devices (except for a check valve) between the pressure sensor and the discharge of the pump as this could create a hazardous situation.

Use ONLY the pressure sensor provided with the unit. Install the pressure sensor into one of the 1/4" holes on the tank tee provided in the kit. Install the pressure sensor vertically to avoid accumulation of debris in the sensor port. Do not install the tank tee with the 1/4" holes facing down. Align the connector on the end of the pressure sensor cable with the mating connector on the pressure sensor and push it on. The tab will lock it in place. Prevent water from following the cable and entering sensor connector by creating a "drip loop" in the cable.

5: MOUNTING THE CONTROLLER

General

Mount the controller in a well ventilated, shaded area using the supplied mounting kit. The controller must be mounted vertically. Be sure to leave 8 inches of free air space on every side of the unit. The controller must be in an area with an ambient between 34° F (1.1° C) and 104° F (40° C). Model 2AB2 will automatically decrease (derate) the maximum output current of the drive (6.9A) if the ambient temperature exceeds 104° F (40° C). The maximum output current of the drive will be decreased by 0.069A for every degree Fahrenheit above 104° F, or -1%/° F. The maximum output current of the drive will be decreased by 0.12A for every degree Celsius above 40° C, or -1.75%/° C. Model 1AB2 does not require ambient derating and will maintain a maximum output current of 4.2A in high ambient temperatures. If installation is more than 3300 feet above sea level, drive output should also be derated by 2% per 1000 feet above 3300 feet.

NOTE: Do not block the heat sink (fins) and do not set anything on the units.



The controller access cover should always be securely fastened to the control box due to the dangerous voltage/shock hazard inside the unit.

6: POWER SUPPLY AND WIRING

Power Supply



The 1151AB2 Controller requires a single phase power supply of 115 volts +/- 15%. The 1AB2 and 2AB2 Controllers require a single phase power supply of 230 volts +/- 15%. All controllers require a dedicated 20 amp two-pole circuit breaker. A dedicated circuit means no other appliances use the same circuit! The output power from the motor controller is three-phase, variable frequency and variable voltage. Maximum output voltage and frequency are line input voltage and 60 Hz, respectively. Low supply voltage will reduce pump performance.

NOTE: Installation and maintenance MUST be performed by properly trained and qualified personnel. Always follow the National Electric Code or Canadian Electric Code, as well as all local, state and provincial codes when wiring the system.

Wire and Conduit

Do not use wire smaller than 14 AWG. Use of Metal Conduit with Metal Conduit Connectors is recommended for all electrical connections.

Output Power Connections



Connect the motor leads for 230 volt or 208 volt operation using the nameplate as a reference. Connect the output power leads from the controller to the 3 motor leads in the conduit box on the motor. Connect the ground (green) output power lead to the ground screw in the conduit box on the motor. This step is performed in its entirety at the factory for complete systems. See diagram 4 for details.

NOTE: If the pump has more than 50 feet of wire from the controller, consult factory for selection of an output load filter (load reactor).

Connecting Input Power



Connect the single-phase power supply leads and Safety Ground wire from a 20 amp two-pole circuit breaker (in the OFF position) to one side of a 20-amp two-pole disconnect switch. Connect the input power leads supplied with the controller to the other side of the disconnect switch. Be sure to use Metal Conduit with Metal Conduit Connectors for electrical connections.



The controller has a high leakage current to ground. The terminals marked "GND" in the controller must be connected to the safety ground from the electrical service entrance. Failure

to properly ground the controller or motor will create an electrical shock hazard.

NOTE: Do not use GFCI protection with this controller. Nuisance tripping will result.

7: STARTING THE SYSTEM



Status Code Indicator Light is not a voltage indicator! Always turn off disconnect switch and circuit breaker before servicing.



Once the controller is powered it will remain electrically charged for 5 minutes after power is turned off. Wait 5 minutes after disconnecting power before opening controller access cover as there is a severe shock hazard.

Setting the Motor Overload Switches



When the unit is powered, the Motor Overload Setting Switches are at a high voltage potential. DO NOT touch the Motor Overload Setting Switches while the power is on.

The Motor Overload Setting Switches adjust the level of motor overload current protection needed to protect the motor from damage due to overcurrent conditions. Turn the circuit breaker and disconnect switch to the off position, and wait 5 minutes. Remove controller access cover. On the inside of the access cover is the Motor Overload Setting table. See Diagram 6 for details. This table shows the switch setting for the desired Motor Overload Setting. Read the Service Factor Amps off the motor nameplate. Use the Motor Overload Setting table to match the Service Factor Amps (SF Amps) of the motor to the correct switch setting. See Diagram 5 for details. Set the Motor Overload Switches according to the correct combination on the table. If the Service Factor Amps of the motor do not match any of the Motor Overload Settings, use the next lowest switch setting. See Diagram 3 for details.

NOTE: The Motor Overload Setting Switches are preset at the factory for complete systems.



Failure to perform this step will result in loss of Motor Overload Protection and will void the Motor Warranty. Nuisance Motor Overload Error tripping or motor damage can occur if these switches are not set properly.

Setting the Pressure

Turn the circuit breaker and disconnect switch to the off position, and wait 5 minutes. Remove controller access cover. Open a faucet in the system and turn the breaker/disconnect switch to the ON position. The pump will start and pressure will increase to the factory preset 50 PSI. After the pressure has stabilized, use the Increase/Decrease Pressure Adjust Pushbuttons on the right-hand side of the controller to adjust the pressure setting.

Push and Hold the Increase or Decrease Pressure Adjust Pushbutton until the desired pressure setting is reached. The new pressure setting is automatically saved. Close the faucet and turn power to controller off. Wait 5 minutes before installing the controller access cover.

NOTE: The maximum allowable pressure setting is 85 psi.

Setting the Application Switches

⚠ DANGER Hazardous voltage When the unit is powered, the Application Setting Switches are at a high voltage potential. **DO NOT** touch the Application Setting Switches while the power is on.

The controller has 6 possible Application Settings. These settings are used to adjust the Minimum Speed of the motor and the Ramp Setting, or acceleration and deceleration ramp. This allows the controller to fit a wide range of applications.

Before adjusting the Application Switches, turn the circuit breaker and disconnect switch to the off position. Wait 5 minutes. Remove the controller access cover. On the inside of the access cover is the Application Switch Setting Table. *See Diagram 6 for details.* This table shows the switch setting needed for the desired system response. *See Diagram 3 for details.*

Select a Minimum Speed of 10 Hz if the pressure at the pump's suction is within 20 PSI of the desired pressure setting. Select a Minimum Speed of 30Hz if the pressure at the pump's suction is more than 20 PSI below the desired pressure setting, if pumping from a tank or if drawing a suction lift.

Changing the Ramp Setting changes how fast the controller can change the speed of the motor. A Slow Ramp Setting allows the controller to work better in applications where the average demand for water is low (less than 3GPM or about 1 faucet). A Fast Ramp Setting allows the controller to work better in applications where the demand for water is high because the motor is allowed to change speed faster.

NOTE: The Application Switches are preset at the factory to "0000" or Minimum Speed = 30 Hz, Ramp Setting = Fast.

Motor Rotation Direction

If the pressure or flow seems low, check motor rotation direction. Turn the circuit breaker and disconnect switch to the off position, and wait 5 minutes. Switch any two leads on the controller output (T1, T2, or T3). Turn the circuit breaker and disconnect switch to the on position. Observe pressure and flow. If pressure or flow still seems low check plumbing.

NOTE: It is possible for the pump to maintain constant pressure with a low flow or a high positive suction head even if the pump is rotating backwards. While the pump is running, use an amp probe on one of the output power leads connected to the motor and compare the current draw between the two rotation directions. The lowest current reading indicates the pump is running in the correct direction.

System Status

The controller is always powered. A Solid Green Status Code indicates that the pump is in standby mode (pump not running) or that the line input voltage is low.

⚠ DANGER Hazardous voltage Status Code Indicator Light is not a voltage indicator! Always turn off disconnect switch and circuit breaker and wait 5 minutes before servicing.

A Blinking Green Status Code indicates that the pump is running. A Blinking or Solid Red Light indicates a problem with the controller. Refer to the access cover side panel or Diagram 6 for Status Codes. *See Section 9 for more details.*

8: DIAGRAMS

Motor Overload and Application Switch Setting



When the unit is powered, the Motor Overload and Application Setting Switches are at a high voltage potential. Always turn off the disconnect switch and circuit breaker and wait 5 minutes before touching the Motor Overload or Application Setting Switches.

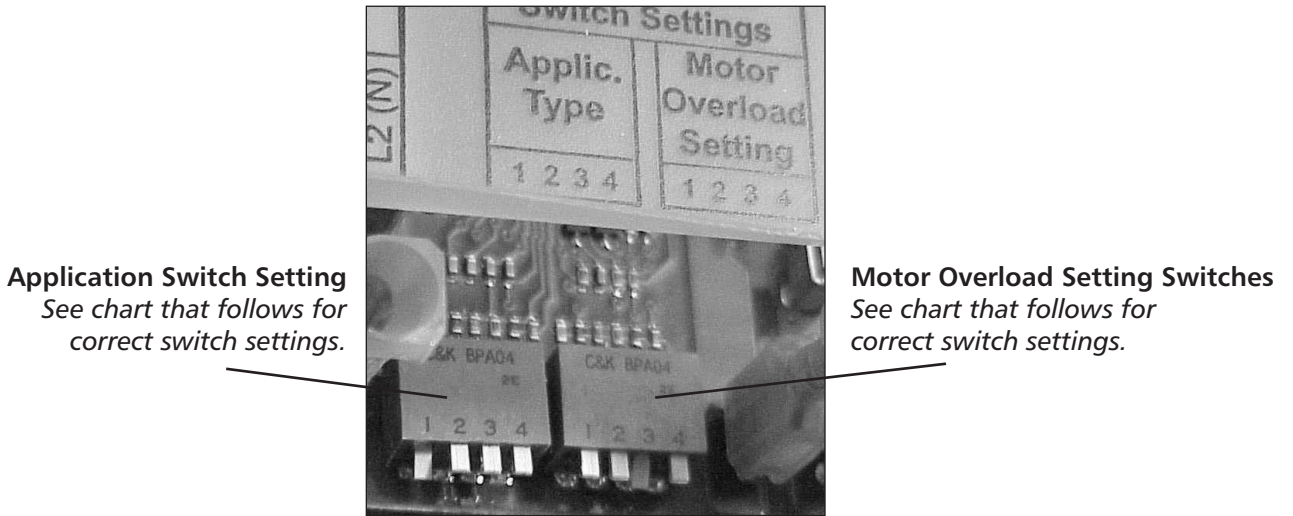
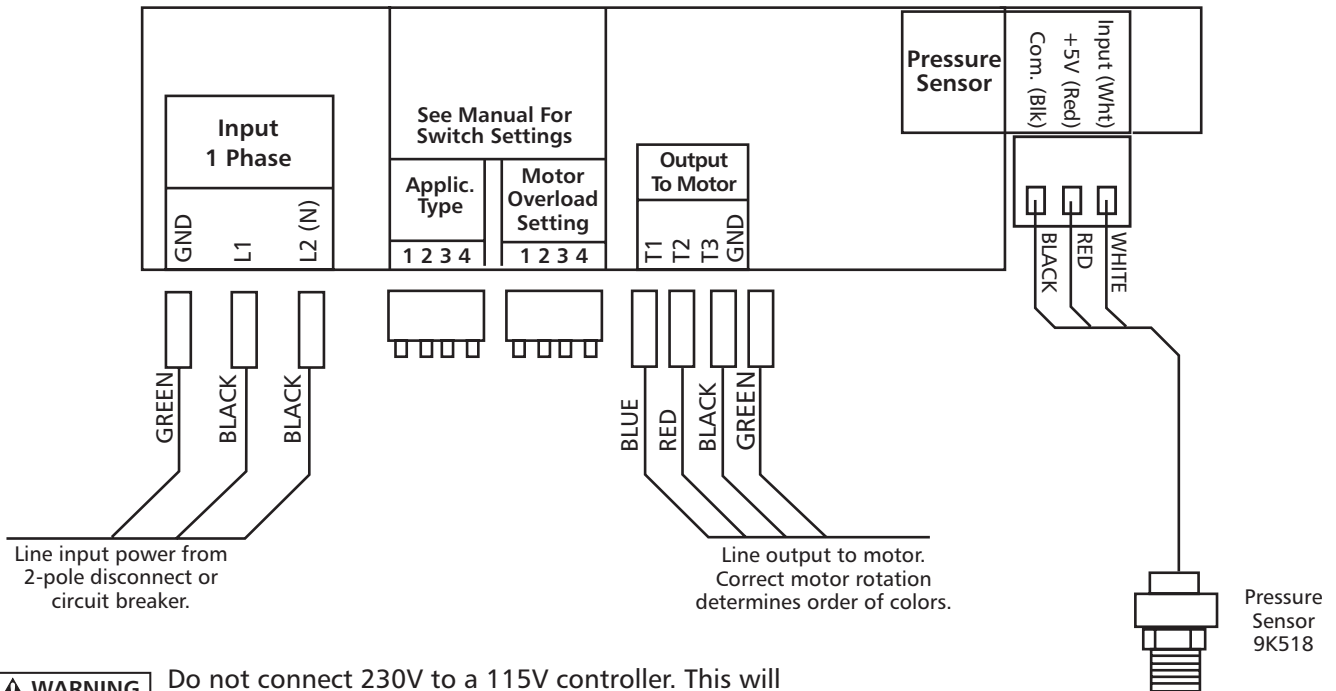


Diagram 3

Aquavar ABII Wiring Diagram

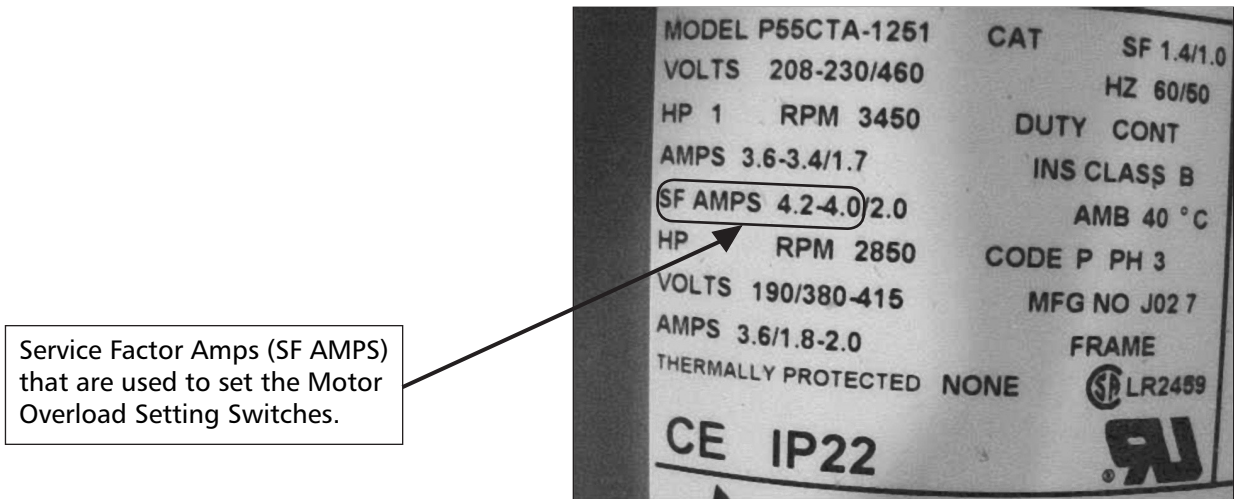


Do not connect 230V to a 115V controller. This will damage the controller and voids the warranty.

Diagram 4

8: DIAGRAMS (continued)

Typical Motor Nameplate Showing Service Factor Amps (SF AMPS)



In this example, use the 4.2 Amp setting indicated on the Motor Overload Setting Table. This setting is used to account for any voltage fluctuation.

Diagram 5

Labels found on the Controller Access Cover:

Motor Overload Setting		
⚠ WARNING		
Disconnect Power And Wait For LED Indicator To Turn Off Before Touching Motor Overload Setting Switches.		
1 = UP		0 = DOWN
DIP Switch Setting	Motor Overload Setting (Amps)	
1 2 3 4	1AB2	2AB2
1 1 1 1	2.5	4.6
1 1 1 0	2.8	5.2
1 1 0 1	3.3	5.3
1 0 1 1	3.5	5.8
0 1 1 1	3.8	6.5
0 0 0 0	4.2	6.9

Motor Overload Setting Label

Use this label to choose the correct Motor Overload Switch Setting. This label is found under the controller access cover.

Application Type Switch Setting		
⚠ WARNING		
Disconnect Power And Wait For LED Indicator To Turn Off Before Touching Application Setting Switches.		
DIP Switch Setting		1 = UP 0 = DOWN
1 2 3 4	Minimum Speed (Hz)	Ramp Setting
1 1 1 1 *	10	Slow
1 1 1 0 *	10	Medium
1 1 0 1 *	10	Fast
1 0 1 1	30	Slow
0 1 1 1	30	Medium
0 0 0 0	30	Fast
*THESE SETTINGS ARE NOT TO BE USED WITH SUBMERSIBLE PUMPS.		

Status Codes*	
Green Light Codes	
Constant	Standby/Low Voltage
Blinking	Pump Running
Red Light Codes	
Constant	Replace Controller
1 Blink	No Water/Loss Of Prime
2 Blinks	Tank Water-Logged
3 Blinks	Pressure Sensor Fault
4 Blinks	Pump or Motor Bound
5 Blinks	Short Circuit
6 Blinks	Ground Fault
7 Blinks	High Temperature
8 Blinks	Over Voltage (>264V)
9 Blinks	Motor Overload
*No Light - No/Very Low Voltage	

Status Code Label

Use this label to diagnose any system errors.

This label is found on the side of the controller access cover.

Application Switch Setting Label

Use this label to choose the correct Application Switch Setting. This label is found under the controller access cover.

Diagram 6

9: TROUBLESHOOTING

General

The Aquavar ABII is a self-diagnosing controller. If a problem occurs, observe the Status Code Indicator Light on the front of the unit. No Status Code Indicator Light means either no or low input voltage (less than 50 V).



Status Code Indicator Light is not a voltage indicator! Always turn off disconnect switch and circuit breaker and wait 5 minutes before servicing. High voltage may still remain on controller.

Refer to the status code label on the side of the controller access cover to diagnose system errors. *See Diagram 6 for details.*

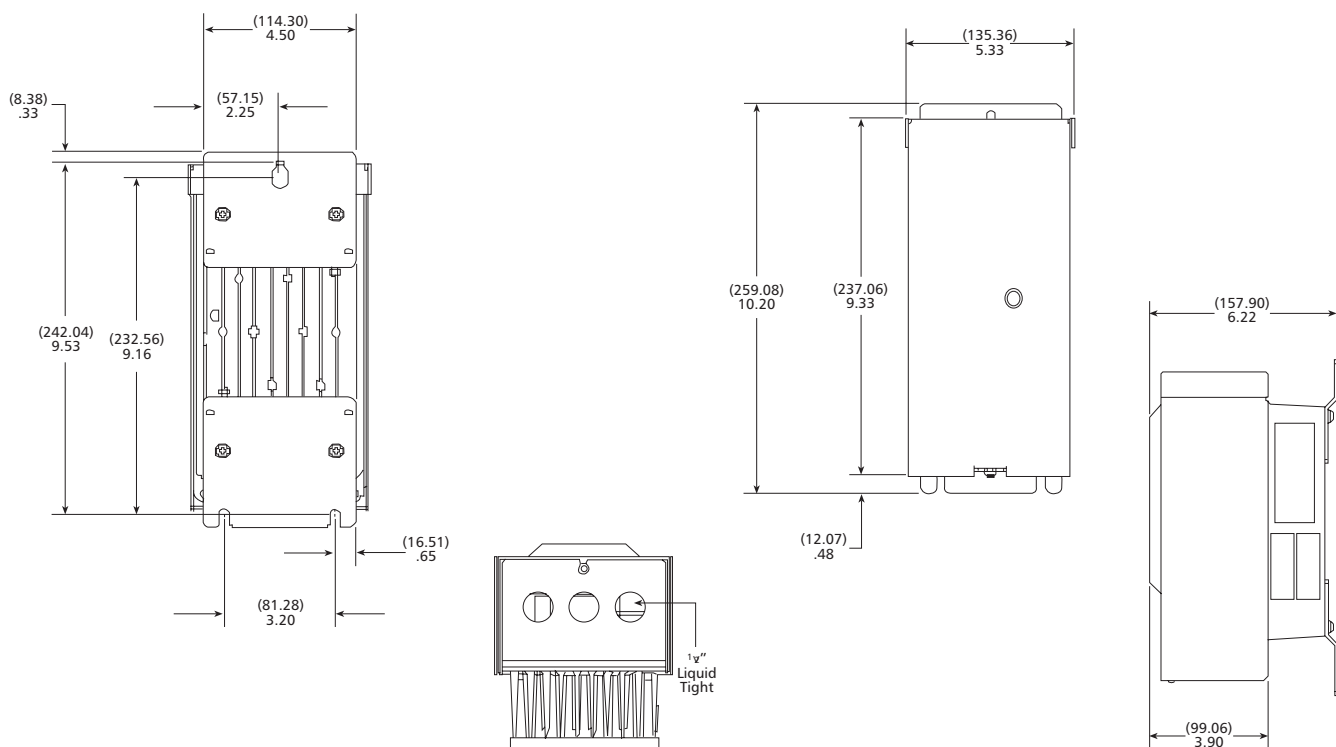
USE THE FOLLOWING TABLE TO HELP TROUBLESHOOT PROBLEMS.

GREEN LIGHT CODES		
Indicator Code	Status	Description
Constant	Standby/Low Voltage	Constant Green Light indicates the pump is off. The system is in Standby mode when there is no flow in the system and the pressure setting has been reached. The system is in a Low Voltage condition when the line input voltage drops below 196VAC for 1AB2 and 2AB2 controllers and 98VAC for 1151AB2 controllers.
Blinking	Pump Running	Flashing Green Light indicates the pump is running. If pump is not running, turn off power to controller and wait 5 minutes . Check output power connections from controller to motor.
RED LIGHT CODES		
Constant	Controller Error	Replace Aquavar ABII Controller
1 Blink	No Water/Loss Of Prime	This fault is indicated if the system pressure drops 5 PSI or more below the set pressure and the output current is less than 75% of the motor overload setting for 10 seconds. The system will automatically restart in 5 minutes. If 3 faults occur in an hour, the system will not restart and will need to be manually reset. If the problem reoccurs, please verify supply capacity, pump capacity, proper setting of the motor overload switches and that there are no restrictions between the supply and the pump.
2 Blinks	Tank Water-Logged	This warning is indicated if there is a drastic drop in system pressure in a short amount of time. The warning will not impact operation. The pump will continue to run. This warning can be caused by low air pressure in the tank or the tank bladder may have failed. This can also be caused by extreme changes in flow. The error is cleared each time the pump starts. If the error reoccurs often, check the air pressure in the tank. Before checking tank air pressure, turn power to control off to prevent pump from turning on. Relieve system pressure by opening a faucet.
3 Blinks	Pressure Sensor Fault	This fault indicates a problem with the pressure sensor feedback. Verify the connections from the Aquavar ABII Controller to the pressure sensor. Turn power to controller off and wait 5 minutes . Remove controller access panel. Be sure sensor cable is wired as shown in Diagram 4. If cable is wired correctly, check the voltage on the Input (White) pressure sensor terminal connection in the Aquavar ABII controller. Using a DC voltmeter, connect the positive lead to the Input (White) pressure sensor terminal connection, connect the negative lead to the Com. (Black) pressure sensor terminal connection. Turn power to controller on. The DC voltage measured should be in the valid range of 0.5 Vdc to 4.5 Vdc (+/- 0.2 Vdc). If the voltage is outside this range, replace pressure sensor.
4 Blinks	Pump or Motor Bound	This fault can be caused by mechanical binding from debris in pump or from an electrical failure in the motor. Verify the error by turning power to controller off for 1 minute and then on. Pump must be checked if error persists.

9: TROUBLESHOOTING (continued)

RED LIGHT CODES		
Indicator Code	Status	Description
5 Blinks	Short Circuit	Check wiring for shorting phase to phase and phase to ground. Turn power to controller off and wait 5 minutes. Remove controller access panel. Disconnect motor leads marked T1, T2, and T3. Measure resistance between all motor leads using an ohmmeter. NOTE: Motor winding resistance is typically 2 to 10 OHMS depending on motor.
6 Blinks	Ground Fault	Check wiring for shorting phase to ground. Turn power to controller off and wait 5 minutes. Remove controller access panel. Disconnect motor leads T1, T2, T3, and Ground from controller. Measure resistance between all motor leads and ground using a Megohmmeter. Connect one Megohmmeter lead to any one of the motor leads and the other to ground lead. Set Megohmmeter to 500V DC output. Resistance readings less than 500,000 ohms or 0.5 Megohms indicate a damaged motor.
7 Blinks	High Temperature	This fault is caused by a high temperature inside of the controller. The controller will shut off when the temperature inside the controller reaches 158° F (70° C). The controller will turn back on when the temperature inside the controller reaches 150° F (65.5° C). Avoid installing the controller where ambient temperatures exceed 104° F (40° C). Avoid installing the controller where it is exposed to direct sunlight.
8 Blinks	Over Voltage	Measure input voltage using an AC voltmeter. Connect the positive and negative leads to L1 and L2 on the Aquavar ABII controller. Verify line input voltage is not greater than 264 VAC for 1AB2 and 2AB2 controllers and 132VAC for 1151AB2.
9 Blinks	Motor Overload	This fault is indicated when the current supplied to the motor exceeds the Motor Overload Setting on the Aquavar ABII controller. Refer to Section 7, <i>Setting the Motor Overload DIP Switches</i> for details. If switches are set according to Section 7, check motor.

10: CONTROLLER DIMENSIONS



GOULDS WATER TECHNOLOGY LIMITED WARRANTY

This warranty applies to all water systems pumps manufactured by Goulds Water Technology.

Any part or parts found to be defective within the warranty period shall be replaced at no charge to the dealer during the warranty period. The warranty period shall exist for a period of twenty-four (24) months from date of installation or thirty (30) months from date of manufacture, whichever period is shorter.

A dealer who believes that a warranty claim exists must contact the authorized Goulds Water Technology distributor from whom the pump was purchased and furnish complete details regarding the claim. The distributor is authorized to adjust any warranty claims utilizing the Goulds Water Technology Customer Service Department.

The warranty excludes:

- (a) Labor, transportation and related costs incurred by the dealer;
- (b) Reinstallation costs of repaired equipment;
- (c) Reinstallation costs of replacement equipment;
- (d) Consequential damages of any kind; and,
- (e) Reimbursement for loss caused by interruption of service.

For purposes of this warranty, the following terms have these definitions:

- (1) "Distributor" means any individual, partnership, corporation, association, or other legal relationship that stands between Goulds Water Technology and the dealer in purchases, consignments or contracts for sale of the subject pumps.
- (2) "Dealer" means any individual, partnership, corporation, association, or other legal relationship which engages in the business of selling or leasing pumps to customers.
- (3) "Customer" means any entity who buys or leases the subject pumps from a dealer. The "customer" may mean an individual, partnership, corporation, limited liability company, association or other legal entity which may engage in any type of business.

THIS WARRANTY EXTENDS TO THE DEALER ONLY.



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